

## Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 19.09.2007

Revision: 19.09.2007

### 1 Identification of substance:

- **Product details:**
- **Trade name:** Tetrahydrofuran
- **Application of the substance / the preparation** Solvents
- **Supplier/Manufacturer:**  
 Penpet Petrochemical Trading GmbH  
 Merkur-Park  
 Sieker Landstrasse 126  
 22143 Hamburg  
 Germany  
 Tel: +49 40 675 799 0  
 Fax: +49 40 675 799 99 / 88
- **Email competent person:** angelika.torges@kft.de
- **Information department:** See supplier/manufacturer
- **Emergency information:** National Poisons Information Centre      Tel.: +44 (0)870 6006266

### 2 Hazards identification

- **Hazard description:**



Xi Irritant  
F Highly flammable

- **Information pertaining to particular dangers for man and environment:**

R 11    Highly flammable.  
 R 19    May form explosive peroxides.  
 R 36/37 Irritating to eyes and respiratory system.

- **Classification system:**

The classification was made according to the latest editions of the EU-lists, and expanded using company data and specialized literature.

### 3 Composition/information on ingredients

- **Chemical characterization:**
- **CAS No. Description:**  
109-99-9 tetrahydrofuran
- **Identification number(s):**
- **EINECS Number:** 203-726-8
- **EU Number:** 603-025-00-0

### 4 First aid measures

- **General information:**  
Take affected persons out of danger area and lay them down.  
Immediately remove any clothing soiled by the product.
- **After inhalation:**  
Remove victim from contaminated area. If breathing is difficult, give oxygen. If breathing stops, provide artificial respiration. Call a doctor.  
In case of unconsciousness, place patients on their side in a stable position for transportation.
- **After skin contact:**  
Wash with water and soap.  
Generally the product does not irritate the skin.
- **After eye contact:** Rinse the eyes with open eyelids for 10 - 15 minutes with water. Then consult an eye specialist immediately.

(Contd. on page 2)

## Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 19.09.2007

Revision: 19.09.2007

**Trade name: Tetrahydrofuran**

(Contd. of page 1)

**· After swallowing:**

Rinse out mouth and then drink plenty of water.

Never give anything by mouth to a unconscious person.

Do not administer milk or alcohol.

Do not administer edible oils or ricinus oil.

Do not induce vomiting.

If vomiting occurs spontaneously:

Hold the head of the casualty low with the body in a prone position in order to avoid penetration of vomit into the air tube (danger of aspiration).

Call a doctor immediately.

**· Information for doctor:**
**· Treatment:**

Symptomatic treatment

(decontamination, vital functions)

In cases of irritation to the lungs, initial treatment with Dexametason metered aerosol.

### 5 Fire fighting measures

**· Suitable extinguishing agents:**

Foam

Fire-extinguishing powder

Water jet spray

**· For safety reasons unsuitable extinguishing agents:** Direct jet water

**· Special hazards caused by the material, its products of combustion or resulting gases:**

Dangerous decomposition product see chapter 10: stability and reactivity

**· Protective equipment:**

Wear self-contained respiratory protective device.

Wear fully protective suit.

**· Additional information:**

Heating leads to pressure increase entailing danger of bursting and explosion. Immediately cool neighbouring packages and containers with sprayed water and, if possible, remove them out of the danger zone

Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

Collect contaminated fire fighting water separately. It must not enter the sewage system.

### 6 Accidental release measures

**· Person-related safety precautions:**


Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Use respiratory protective device against the effects of fumes/dust/aerosol.

Do not smoke - keep ignition sources away

**· Measures for environmental protection:**

Do not allow product to reach sewage system or any water course.

Prevent seepage into sewage system, workpits and cellars.

Dilute with plenty of water.

**· Measures for cleaning/collecting:**

Ensure adequate ventilation.

Absorb with non-combustible material like sand, soil or diatomite.

Dispose contaminated material as waste according to item 13.

Send for recovery or disposal in suitable receptacles.

## Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 19.09.2007

Revision: 19.09.2007

**Trade name:** Tetrahydrofuran

(Contd. of page 2)

### 7 Handling and storage

- **Handling**

- **Information for safe handling:**

- Open and handle receptacle with care.
- Ensure good ventilation/exhaustion at the workplace.
- Ensure good interior ventilation, especially at floor level. (Fumes are heavier than air).
- Keep away from heat and direct sunlight.
- Prevent formation of aerosols.
- Avoid contact with eyes and skin.
- Avoid inhalation of vapours.

- **Information about protection against explosions and fires:**



Keep ignition sources away - Do not smoke.

- Protect against electrostatic charges
- Use explosion-proof apparatus / fittings and spark-proof tools.
- Work on containers and pipelines is permitted only after thorough purging and inerting.
- No welding.
- Use spark-proof tools only.

- **Storage**

- **Requirements to be met by storerooms and receptacles:**

- Store container tightly sealed at a cool and dry place with sufficient ventilation.
- Pay attention to special rules for the storage of flammable liquids.
- Provide solvent resistant, sealed floor.
- Suitable material for containers and packaging:
  - Stainless steel
  - Polyethylene
  - Polytetrafluoroethylen
  - Aluminium
- Unsuitable material:
  - Tin
  - Rubber

- **Information about storage in one common storage facility:**

- Store away from foodstuffs.
- Store away from feed.
- Follow regulations for flammable liquids.

- **Further information about storage conditions:**

- Keep receptacle tightly sealed.
- Protect from heat and direct sunlight.
- Protect from exposure to the light.
- Avoid contact with air / oxygen.(formation of peroxide).
- If stored for a longer period it is recommended to store under inert gas (e.g. nitrogen)

- **Storage class** 3A Flammable Liquids

### 8 Exposure controls and personal protection

- **Additional information about design of technical systems:** No further data; see item 7.

- **Components with limit values that require monitoring at the workplace:**

- **109-99-9 tetrahydrofuran**

- |                        |   |
|------------------------|---|
| WEL (Great Britain)    | Short-term value: 300 mg/m <sup>3</sup> , 100 ppm |
|                        | Long-term value: 150 mg/m <sup>3</sup> , 50 ppm   |
|                        | Skin  |
| IOELV (European Union) | Short-term value: 300 mg/m <sup>3</sup> , 100 ppm |
|                        | Long-term value: 150 mg/m <sup>3</sup> , 50 ppm   |
|                        | Skin  |

(Contd. on page 4)

## Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 19.09.2007

Revision: 19.09.2007

**Trade name: Tetrahydrofuran**

(Contd. of page 3)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Personal protective equipment**

· **General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.  
 Immediately remove all soiled and contaminated clothing  
 Wash hands before breaks and at the end of work.  
 Avoid contact with the eyes and skin.  
 Use skin protection cream for skin protection.

· **Breathing equipment:**

In case of unintentional release of the substance, exceeding the occupational exposure limit value:



In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Short term filter device:

Filter A

· **Protection of hands:**

Protective gloves.

Chemical resistant gloves

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Check protective gloves prior to each use for their proper condition.

· **Material of gloves:**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· **Penetration time of glove material:**

The exact break-through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Not suitable are gloves made of the following materials:**

Polychloropren rubber (CR)

Fluorocarbon rubber (FKM)

Butyl rubber, BR

Nitrile rubber, NBR

Natural rubber, NR

Glove (tree-ply) - PE/EVAL/PE

(PE=Polyethylene; EVAL=Ethylene-vinyl-alcohol-copolymer)

· **Eye protection:** Tightly sealed goggles.

· **Body protection:** Flame retarding, antistatic protective clothing.

### 9 Physical and chemical properties:

· **General Information**

<b>Form:</b>	Fluid
<b>Colour:</b>	Colourless
<b>Odour:</b>	Ether-like

· **Change in condition:**

**Melting point/Melting range:** -108.5°C

**Boiling point/Boiling range:** 65.5°C

· **Flash point:** -21 - ca.°C

· **Ignition temperature:** 230°C

· **Danger of explosion:** May form explosive peroxides.

· **Explosion limits:**

**Lower:** 1.5 Vol %

(Contd. on page 5)

## Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 19.09.2007

Revision: 19.09.2007

**Trade name: Tetrahydrofuran**

(Contd. of page 4)

<b>Upper:</b>	12 Vol %
· <b>Vapour pressure at 20°C:</b>	200 hPa
· <b>Density at 20°C:</b>	0.8892 g/cm <sup>3</sup>
· <b>Solubility in / Miscibility with Water:</b>	Fully miscible

### 10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:**  
No decomposition if used and stored according to specifications.  
To avoid thermal decomposition do not overheat.  
No heating under inclusion - Danger of explosion!!!
- **Materials to be avoided:**  
Oxidants  
Air/oxygen
- **Dangerous reactions:**  
Possible formation of peroxide  
Danger of explosion
- **Dangerous products of decomposition:**  
In the case of fire or at high temperatures the formation of the following decomposition products is possible.  
Carbon monoxide and carbon dioxide  
Poisonous gases/vapours
- **Additional information:** Sensitive to light

### 11 Toxicological information

- **Acute toxicity:**
- **LD/LC50 values that are relevant for classification:**  
Oral LD50 3000 mg/kg (rat)
- **Primary irritant effect:**
- **on the skin:**  
Irritant to skin and mucous membranes.  
Continuing or repeated contact with the skin may cause skin disease.  
Irritating to mucous membrane and respiratory tract.
- **on the eye:** Irritating effect.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**  
In addition to local irritant manifestations, there is a narcotic effect when inhaling high concentrations, with the danger of central respiratory arrest.

### 12 Ecological information

- **Ecotoxicological effects:**
- **Aquatic toxicity:**  
EC50/24h > 580 mg/L (bacteriae)  
EC50/96h > 3700 mg/L (algae)  
LC50/24h 5930 mg/L (daphnia magna)  
LC50/96h 2160 mg/L (Pimephales promelas)
- **General notes:**  
Water hazard class 1 (German Regulation) (Assessment by list): slightly hazardous for water.  
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

## Safety Data Sheet

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Printing date: 19.09.2007

Revision: 19.09.2007

**Trade name: Tetrahydrofuran**

(Contd. of page 5)

### 13 Disposal considerations

- **Product:**
- **Recommendation:**



Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

Must be specially treated adhering to official regulations.

- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.
- **Recommended cleansing agent:** Water, if necessary with cleansing agents.

### 14 Transport information

- **Land transport ADR/RID (cross-border)**



- **ADR/RID class:** 3 (F1) Flammable liquids.
- **Danger code (Kemler):** 33
- **UN-Number:** 2056
- **Packaging group:** II
- **Label:** 3
- **Description of goods:** 2056 TETRAHYDROFURAN
- **Remarks:** ADR chapter 1.10 (security) has to be observed!  
Limited quantity: 3 l inner packaging, 30 kg gross packaging unit

- **Maritime transport IMDG:**



- **IMDG Class:** 3
- **UN Number:** 2056
- **Label:** 3
- **Packaging group:** II
- **EMS Number:** F-E, S-D
- **Marine pollutant:** No
- **Proper shipping name:** TETRAHYDROFURAN

- **Air transport ICAO-TI and IATA-DGR:**



- **ICAO/IATA Class:** 3
- **UN/ID Number:** 2056
- **Label:** 3
- **Packaging group:** II
- **Proper shipping name:** TETRAHYDROFURAN

(Contd. on page 7)

## Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 19.09.2007



Revision: 19.09.2007

**Trade name: Tetrahydrofuran**

(Contd. of page 6)

- **Remarks:**
- **Packing Instructions:**  
 For Limited Quantities: Y305 (Max Net Qty/Pkg: 1 l)  
 Passenger and Cargo Aircraft: 305 (Max Net Qty/Pkg: 5 l)  
 Cargo Aircraft only: 307 (Max Net Qty/Pkg: 60 l)

### 15 Regulations

- **Markings according to EC guidelines:**  
 The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials "EC-labelling"
- **Code letter and hazard designation of product:**  


  - Xi Irritant
  - F Highly flammable
- **Risk phrases:**  
 11 Highly flammable.  
 19 May form explosive peroxides.  
 36/37 Irritating to eyes and respiratory system.
- **Safety phrases:**  
 16 Keep away from sources of ignition - No smoking.  
 29 Do not empty into drains.  
 33 Take precautionary measures against static discharges.
- **National regulations**
- **Information about limitation of use:** Restrictions on juvenile employment must be observed.
- **Technical guidance (air):**
- **Class Share in %**
- **NK 100.0**
- **Water hazard class:** Water hazard class 1 (Assessment by list): slightly hazardous for water.

### 16 Other information:

- This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.
- **Department issuing MSDS:**  
 KFT-Chemieservice Marienstr. 3 D-64347 Griesheim  
 Postfach 1451 D-64345 Griesheim  
 Tel.: +49-6155-823241 Fax: +49-6155-823246
  - **Contact:** Angelika Torges

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