

SAFETY DATA SHEET  
According to Directive 2001/58/EC

## ALKOR® PLUS 81025

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

#### 1.1. Identification of the substance/preparation

Product name	:	ALKOR® PLUS 81025
Chemical Name	:	Tetrahydrofuran
Chemical characterization	:	Stabilized product
Synonyms	:	Diethylene oxide, Tetramethylene oxide, THF
Molecular formula	:	C <sub>4</sub> H <sub>8</sub> O
Molecular Weight	:	72.11 g/mol

#### 1.2. Use of the Substance/Preparation

Recommended use	:	- Solvents
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#### 1.3. Company/Undertaking Identification

Address	:	<b>RENOLIT</b> Belgium N.V. INDUSTRIEPARK DE BRUWAAN 9 B- 9700 OUDENAARDE
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Telephone	:	3255339711
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Telefax	:	3255319650
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#### 1.4. Emergency telephone number

Telephone	:	+44(0)208 762 8322 [CareChem 24] (Europe)
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### 2. COMPOSITION/INFORMATION ON INGREDIENTS

Tetrahydrofuran		
CAS-No.	:	109-99-9
Annex-1	:	603-025-00-0
EINECS-No.	:	203-726-8
Symbol(s)	:	F, Xi
R-phrases(s)	:	R11, R19, R36/37
Concentration	:	> 99.00 %

### 3. HAZARDS IDENTIFICATION

Appearance	:	volatile, mobile liquid
Colour	:	colorless/colourless
Odour	:	ethereal

- This substance is classified and labelled according to Annex I of Directive 67/548/EEC, as amended.
- Highly flammable
- May form explosive peroxides.
- Irritating to eyes and respiratory system.



## 4. FIRST AID MEASURES

### 4.1. Inhalation

- Remove the subject from the contaminated area as soon as possible; transport him/her lying down, with the head higher than the body, to a quiet, uncontaminated and well-ventilated location..
- Oxygen or pulmonary resuscitation if necessary.
- Keep warm (blanket).
- Consult with a physician in case of respiratory and nervous symptoms.

### 4.2. Eye contact

- Flush eyes as soon as possible with running water for 15 minutes, while keeping the eyelids wide open.
- Consult with an ophthalmologist in all cases.

### 4.3. Skin contact

- Remove contaminated shoes, socks and clothing; wash the affected skin with soap and water.
- Clean clothing.
- Consult with a physician in case of persistent pain or redness.

### 4.4. Ingestion

***The following actions are recommended :***

- Contact a physician for advice.

***If victim is conscious:***

- Give to drink fresh water added with activated charcoal.
- Do NOT induce vomiting.

***If victim is unconscious but breathing:***

- Classical resuscitation measures.

## 5. FIRE-FIGHTING MEASURES

### 5.1. Suitable extinguishing media

- Powder
- Foam, AFFF.
- CO2
- Water spray

### 5.2. Extinguishing media which must not be used for safety reasons

- Jet of water

### 5.3. Special exposure hazards in a fire

- Highly flammable (see section 9).
- Gas/vapours easily mix with air, producing an explosive mixture.
- A weak energy source may cause ignition.
- Gas/vapours are heavier than air and so may travel along the ground; remote ignition possible.
- Static electricity accumulation hazard.
- Formation of dangerous gas/vapours in case of combustion.

### 5.4. Special protective equipment for fire-fighters

- Evacuate all non-essential personnel.
- Fire fighters must wear fire resistant personnel protective equipment.
- Wear self contained breathing apparatus when in close proximity or in confined spaces.

### 5.5. Other information

- If safe to do so, remove the exposed containers, or cool with large quantities of water.
- Never approach containers which have been exposed to fire, without cooling them sufficiently.



- Avoid propagating the fire when directing the extinguishing agent as a jet onto the surface of the burning liquid.
- Avoid propagating the fire, by flotation of the product (density < 1).

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1. Personal precautions

- If safe to do so, without over exposing anyone, try to stop the leak.
- Eliminate all sources of ignition, and do not generate flames or sparks.
- Wear self-contained breathing apparatus in confined spaces/if oxygen depletion/in case of significant emissions.
- Follow the protective measures given in section 5.
- Follow the protective measures given in section 8.
- Ventilate the premises.

### 6.2. Environmental precautions

- Immediately notify the appropriate authorities in case of significant discharge.
- Prevent discharges into the environment (sewers, rivers, soils,...).

### 6.3. Methods for cleaning up

- Remove the product with an inert absorbent (sand, kieselguhr, vermiculite, ...).
- If possible, dam large quantities of liquid with sand or earth.
- Prevent the product from entering sewers or confined places.
- Place everything into a closed, labelled container compatible with the product.
- Store the product in a safe and isolated place.
- For disposal methods, refer to section 13.
- Clean the area with large quantities of water.

## 7. HANDLING AND STORAGE

### 7.1. Handling

- Operate in a well-ventilated area.
- Keep away from ignition and heat sources.
- Keep away from reactive products (see section 10).
- Do not use compressed air for transferring or handling the product.
- Do not use tools that produce sparks.
- Avoid any contact with air.

### 7.2. Storage

- In the open air
- In a ventilated, cool area.
- Protect from direct sunlight.
- Keep away from reactive products (see section 10).
- Keep away from ignition and heat sources.
- Under inert gas.
- Containment bund around storage containers and transfer installation.

### 7.3. Specific use(s)

- For any particular use, please contact the supplier.

### 7.4. Packaging material

- Ordinary steel

### 7.5. Other information

- No open flames or sparks, no smoking.
- Provide electrical equipment safe for hazardous locations.
- Grounded equipment.
- Warn people about the dangers of the product.



## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1. Exposure Limit Values

#### **Tetrahydrofuran**

- US. ACGIH Threshold Limit Values 2005  
TWA = 50 ppm  
Remarks: Skin
- US. ACGIH Threshold Limit Values 2005  
STEL = 100 ppm  
Remarks: Skin
- WEL (UK) 2005  
TWA = 50 ppm  
TWA = 150 mg/m<sup>3</sup>  
Remarks: Skin
- WEL (UK) 2005  
STEL = 100 ppm  
STEL = 300 mg/m<sup>3</sup>  
Remarks: Skin

### 8.2. Exposure controls

- Maintain employee exposures to levels below the applicable exposure limits.
- Follow the protective measures given in section 7.

#### **8.2.1. Occupational exposure controls**

##### **8.2.1.1. Respiratory protection**

- In case of emissions, face mask with type A cartridge.
- Self-contained breathing apparatus in medium confinement/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.

##### **8.2.1.2. Hand protection**

- Protective gloves - chemical resistant:
- Recommended materials: Teflon ®
- Recommended materials: Polyvinylalcohol
- Recommended materials : 4H ®

##### **8.2.1.3. Eye protection**

- Wear protective goggles for all industrial operations.
- If risk of splashing, chemical proof goggles/face shield.

##### **8.2.1.4. Skin and body protection**

- Protective clothing suitable for the handling of chemicals.
- Apron/boots of PVC if risk of splashing.

##### **8.2.1.5. Hygiene measures**

- Shower and eye wash stations.
- Consult the industrial hygienist or the safety manager for the selection of personal protective equipment suitable for the working conditions.

#### **8.2.2. Environmental exposure controls**

- Respect local/federal and national regulations for aqueous emissions (see section 15).

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. General Information (appearance, odour)

**Appearance** : volatile, mobile liquid



**Colour** : colorless/colourless

**Odour** : ethereal

## 9.2. Important Health Safety and Environmental Information

**pH** : 7 - 8  
*Temperature: 20 °C*

**Boiling point/range** : 65 - 66 °C

**Flash point** : -21 °C  
*Method: closed cup*

**Flammability (solid, gas)** : Upper explosion limit:  
12 %(V)  
Lower explosion limit:  
1.5 %(V)

**Explosive properties** : *Remarks: Explosion possible with gas/vapour and air mixtures.*

**Vapour pressure** : 173 hPa  
*Temperature: 20 °C*  
: 586 hPa  
*Temperature: 50 °C*

**Relative density / Density** : 0.9

**Solubility** : Miscible in all proportions with:  
: Water  
: Soluble in  
: Most organic solvents

**Partition coefficient (n-octanol/water)** : log Pow:  
0.47

**Viscosity** : 0.5 mPa.s  
*Temperature: 20 °C*

**Vapour density** : 2.5

## 9.3. Other data

**Freezing point** : -108 °C

**Autoinflammability** : 215 °C

## 10. STABILITY AND REACTIVITY

### 10.1. Stability

- Stable under recommended storage conditions.

### 10.2. Conditions to avoid

- Light
- Naked flames, sparks.
- Heat/Sources of heat

### 10.3. Materials to avoid

- Air
- Oxygen
- Strong oxidizing agents
- Acids



- Bases
- Certain plastic materials

#### 10.4. Hazardous decomposition products

- Peroxydes

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Toxicological data

#### **Acute oral toxicity**

- LD 50, rat, > 2,000 mg/kg

#### **Acute inhalation toxicity**

- LC50, 4 h, rat, 61,935 mg/m<sup>3</sup>

#### **Skin irritation**

- Various species, irritant (skin)

#### **Eye irritation**

- Various species, irritant (eyes)

#### **Irritation (other route)**

- Various species, irritant (respiratory tract)

#### **Sensitization**

- Non sensitizing (skin)

#### **Chronic toxicity**

- Inhalation, after prolonged exposure, Various species, Target Organs: Central nervous system, gastro-intestinal system, hematology system, Respiratory system, observed effect

#### **Possible hazards (summary)**

- Irritant effect for the skin, the eyes and respiratory tract
- Risk of effect on the gastro-intestinal and nervous systems
- Risk of hematological effect
- Risk of effect on the respiratory system
- The carcinogenic effect is not demonstrated in human
- No mutagenic, teratogenic effects

### 11.2. Health effects

#### **Main effects**

- Irritating to mucous membrane, eyes and skin.

#### **Inhalation**

- Nose and throat irritation.
- At high concentrations, cough.
- At high concentrations, headaches, fatigue and risk of nervous system effects.
- At high concentrations, feelings of intoxication, restlessness, dizziness, nausea, vomiting, drowsiness.
- At high concentrations, risk of narcosis.

#### **Eye contact**

- Severe eye irritation, watering and redness.
- Risk of temporary eye lesions.

#### **Skin contact**

- The product can be absorbed by intact skin.
- Moderate irritation.
- In case of repeated contact : dry and chapped skin, risk of chronic dermatitis.

#### **Ingestion**

- Breath smells of chloroform.
- Severe irritation of the mouth, throat, oesophagus and stomach.
- Nausea, vomiting, abdominal cramps and diarrhea.



- Risk of chemical pneumonitis from product inhalation.
- By ingestion of large quantities: drowsiness.

## 12. ECOLOGICAL INFORMATION

### 12.1. Ecotoxicity effects

#### *Acute toxicity*

- Fishes, various species, LC50, 48 - 96 h, > 100 mg/l
- Crustaceans, various species, EC 50, 24 h, > 100 mg/l

#### *Chronic toxicity*

- Algae, various species, EC 50, 24 h, > 100 mg/l

#### *Further information on ecology*

- Bacteria, various species, EC 50, activity inhibition, > 100 mg/l

### 12.2. Mobility

- Remarks: no data

### 12.3. Persistence and degradability

#### *Abiotic degradation*

- Air, indirect photo-oxidation, t 1/2 1.6 d  
Conditions: sensitizer: OH radicals

#### *Biodegradation*

- aerobic, Tested according to: ready biodegradability/closed bottle, degradation 39 %  
Remarks: non-readily biodegradable

### 12.4. Bioaccumulative potential

- Bioconcentration: log Po/w 0.47  
Result: improbable bioaccumulation

### 12.5. Other adverse effects

- no data available

### 12.6. Possible hazards (summary)

- Non-hazardous for aquatic organisms.
- Product is not known as hazardous for the environment.

## 13. DISPOSAL CONSIDERATIONS

### 13.1. Waste from residues / unused products

- Dispose in compliance with local/federal and national regulations.
- Send the product to an authorized hazardous waste incinerator.

### 13.2. Packaging treatment

- Rinse the empty containers with a low volatility hydrocarbon and treat the effluent in the same way as waste.
- Or
- Dispose of the containers by dispatching them to an approved incineration facility for hazardous waste.
- Containers that cannot be cleaned must be treated as waste.

## 14. TRANSPORT INFORMATION

UN-No

2056

IATA-DGR



Class 3  
Packing group II  
ICAO-Labels FLAMMABLE LIQUID  
Proper shipping name: TETRAHYDROFURAN

#### IMDG

Class 3  
Packing group II  
IMO-Labels Flammable Liquids  
HI/UN No. 2056  
EmS: F-E, S-D  
Proper shipping name: TETRAHYDROFURAN

#### ADR

Class 3  
Packing group II  
ADR/RID-Labels 3  
HI/UN No. 33/2056  
Proper shipping name: TETRAHYDROFURAN

#### RID

Class 3  
Packing group II  
ADR/RID-Labels 3  
HI/UN No. 33/2056  
Proper shipping name: TETRAHYDROFURAN

## 15. REGULATORY INFORMATION

### 15.1. EC Label

- Hazardous components which must be listed on the label: Tetrahydrofuran
- This substance is classified and labelled according to Annex I of Directive 67/548/EEC, as amended.

Symbol(s)	F Xi	Highly flammable Irritant
R-phrase(s)	R11 R19 R36/37	Highly flammable. May form explosive peroxides. Irritating to eyes and respiratory system.
S-phrase(s)	S 2 S16 S29 S33	Keep out of the reach of children. Keep away from sources of ignition - No smoking. Do not empty into drains. Take precautionary measures against static discharges.

### 15.2. Other information

- Indicate on the label: EC LABELING

## 16. OTHER INFORMATION

### 16.1. Administrative information



- Update  
This data sheet contains changes from the previous version in section(s): 1, 3, 8.1, 10, 12, 15, 16
- Distribute new edition to clients

16.2. Text of R phrases mentioned in Section 2

- R11 : Highly flammable.
- R19 : May form explosive peroxides.
- R36/37 : Irritating to eyes and respiratory system.

This MSDS is intended for only the selected countries to which it is applicable. For example, this MSDS is not intended for use nor distribution within North America.

The information given corresponds to the current state of our knowledge and experience of the product, and is not exhaustive. This applies to product which conforms to the specifications, unless otherwise stated. In this case of combinations and mixtures one must make sure that no new dangers can arise. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and protection of human welfare and the environment.

