

SAFETY DATA SHEET

(according to Directive 2001/58/EC)

ALKORFLEX® 81036/001

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

1.1. Identification of the substance or preparation

Product name : ALKORFLEX® 81036/001
Chemical name : Tetrahydrofuran
Chemical characterisation : Stabilized product

1.2. Use of the substance/preparation

Recommended uses : - Welding and soldering agents

1.3. Company/undertaking identification

Address :
INDUSTRIEPARK DE BRUWAAN 9
B- 9700 OUDENAARDE

Tel. : 3255339711

Fax : 3255319650

1.4. Emergency telephone

Tel. : 80076767600 (Europe)
498945560321 (Europe)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Tetrahydrofuran

CAS Number : 109-99-9
ID Number (Annex I) : 603-025-00-0
EC Number (EINECS) : 203-726-8
Symbols : F, Xi
Phrases R : 11, 19, 36/37
Concentration : > 80.00 %

Barium compounds

ID Number (Annex I) : 056-002-00-7
Symbols : Xn
Phrases R : 20/22
Concentration : < 1.00 %

3. HAZARDS IDENTIFICATION

- Preparation classified as dangerous according to Directive 1999/45/EC.
- Highly flammable
- May form explosive peroxides.
- Principal effect due to irritant properties.
- Contains a harmful component.



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. Eyes 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

General recommendations

- Contact a physician for advice.

If the subject is completely conscious:

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

If the subject is unconscious:

- Classical resuscitation measures.

5. FIRE-FIGHTING MEASURES

5.1. Suitable extinguishing media

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

5.2. Unsuitable extinguishing media

- Jet of water

5.3. Special exposure hazards

- 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. Protective measures in case of intervention

- 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 precautions

- 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 means in a jet on 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

- Ordinary steel

7.5. Other precautions

- 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

TLV (ACGIH-USA) 2004

TWA = 200 ppm

TWA = 590 mg/m³

STEL = 250 ppm

STEL = 737 mg/m³

Tetrahydrofuran

OES (HSE-UK)

TWA = 100 ppm

TWA = 300 mg/m³

STEL = 200 ppm

STEL = 599 mg/m³

Remark: Skin

Tetrahydrofuran

OEL (EU)

TWA = 50 ppm

TWA = 150 mg/m³

STEL = 100 ppm

STEL = 300 mg/m³

Remark: Skin

Barium compounds

TLV (ACGIH-USA) 2004

TWA = 0.5 mg/m³

Remark: In Ba, soluble compounds of Ba.

Barium compounds

OEL (EU)

TWA = 0.5 mg/m³

Remark: In Ba, soluble compounds of Ba.

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 protection*

- Protective clothing suitable for the handling of chemicals.



- Apron/boots of PVC if risk of splashing.

8.2.1.5. Other precautions

- 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	:	volatile, mobile liquid
Color/Colour	:	colorless/colourless
Odor/Odour	:	ethereal

9.2. Important health, safety and environmental information

pH	:	7 - 8 <i>Temperature: 20 °C</i>
Boiling point	:	65 - 66 °C
Flash point	:	-21 °C <i>Method: closed cup</i>
Flammability	:	<u>Upper limit:</u> 12 %(V) <u>Lower limit:</u> 1.5 %(V)
Explosive properties	:	<i>Remark:</i> Explosion possible with gas/vapour and air mixtures.
Vapor/vapour pressure	:	173 hPa <i>Temperature: 20 °C</i> 586 hPa <i>Temperature: 50 °C</i>
Density	:	<u>Specific gravity:</u> 0.9
Solubility	:	Miscible in all proportions with: Water Soluble in Most organic solvents
Partition coefficient: n-octanol/water	:	<u>log P o/w:</u> 0.47
Viscosity	:	0.5 mPa.s <i>Temperature: 20 °C</i>
Vapor/vapour density (air=1)	:	2.5

9.3. Other information

Freezing point	:	-108 °C
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Auto-flammability	: 215 °C
Remarks	: All physico-chemical data are related to the main product(s), if not mentioned contrary.

10. STABILITY AND REACTIVITY

10.1. Conditions to avoid

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

10.2. Materials to avoid

- Air
- Oxygen
- Strong oxidizing agents
- Acids
- Bases
- Certain plastic materials.

10.3. Hazardous decomposition products

- Peroxydes

11. TOXICOLOGICAL INFORMATION

11.1. Toxicological datas

Acute toxicity

- Oral route, LD 50, rat, > 2,000 mg/kg (Tetrahydrofuran)
- Inhalation, LC 50, 4 h, rat, 21,000 ppm (Tetrahydrofuran)

Irritation

- Various species, irritant (skin) (Tetrahydrofuran)
- Various species, irritant (eyes) (Tetrahydrofuran)
- Various species, irritant (respiratory tract) (Tetrahydrofuran)

Sensitization

- Non sensitizing (skin) (Tetrahydrofuran)

Chronic toxicity

- Inhalation, after prolonged exposure, various species, Target organ: central nervous system / gastro-intestinal system / hematology system / respiratory system, observed effect (Tetrahydrofuran)
- No mutagenic, teratogenic effects (Tetrahydrofuran)

Comments

- No specific data
- 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

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.

Eyes 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

Acute ecotoxicity

- Fishes, various species, LC 50, 48 - 96 h, > 100 mg/l (Tetrahydrofuran)
- Crustaceans, various species, EC 50, 24 h, > 100 mg/l (Tetrahydrofuran)
- Algae, various species, EC 50, 24 h, > 100 mg/l (Tetrahydrofuran)
- Bacteria, various species, EC 50, activity inhibition, > 100 mg/l (Tetrahydrofuran)

12.2. Mobility

- Result: no data

12.3. Persistence and degradability

Abiotic degradation

- Air, indirect photo-oxidation, t 1/2 1.6 day(s)
Conditions: sensitizer: OH radicals
(Tetrahydrofuran)

Biotic degradation

- Aerobic, test ready biodegradability/closed bottle, degradation 39 %
Result: non-readily biodegradable
(Tetrahydrofuran)

12.4. Bioaccumulative potential

- Bioconcentration: log Po/w 0.47
Result: improbable bioaccumulation
(Tetrahydrofuran)

12.5. Other adverse effects

- Study in progress

12.6. Comments

- No specific data.
- Product is not known as hazardous for the environment.



13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment

- 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 Number	3271
IATA Class:	3
Packing group:	II
Hazard label:	FLAMMABLE LIQUID
PSN: ETHER, N.O.S. (MIXTURE, CONTAINS TETRAHYDROFURAN)	
IMDG Class:	3
Packing group:	II
Hazard label:	FLAMMABLE LIQUID
Placard:	3271
EmS:	F-E, S-D
IMDG Name: ETHER, N.O.S. (MIXTURE, CONTAINS TETRAHYDROFURAN)	
ADR/ADNR Class	3
Packing group:	II
Hazard label:	3
Placard:	33/3271
ADR/RID Name: ETHER, N.O.S. (MIXTURE, CONTAINS TETRAHYDROFURAN)	
RID Class:	3
Packing group:	II
Hazard label:	3
Placard:	33/3271
ADR/RID Name: ETHER, N.O.S. (MIXTURE, CONTAINS TETRAHYDROFURAN)	

15. REGULATORY INFORMATION

15.1. EC Labelling

- Name of dangerous product(s) (to indicate on the label): Tetrahydrofuran
- Labelling following Directive 1999/45/EC.

Symbols	F	Highly flammable
	Xi	Irritant
Phrases R	11	Highly flammable.
	19	May form explosive peroxides.
	36/37	Irritating to eyes and respiratory system.
Phrases S	(2)	(Keep out of the reach of children.)



16	Keep away from sources of ignition --- No smoking.
29	Do not empty into drains.
33	Take precautionary measures against static discharges.

16. OTHER INFORMATION

16.1. Reason for update

- General revision
- Distribute new edition to clients

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. You should contact RENOLIT America company representative for the official North America MSDS.

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 specification, 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.

