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	Print Date: 30.09.2013
	MSDS Number: R0718323 Version: 1.1

Conforms to EU Regulation 1907/2006/EC as amended. - SDSCLP\_GB

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifier

Trade name : TETRAHYDROFURAN 250 PPM BHT

Registration number : 01-2119444314-46-0010

Substance name : tetrahydrofuran

Substance No.

Index-No. : 603-025-00-0

EC-No. : 203-726-8

CAS-No. : 109-99-9

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Laboratory chemicals  
Solvent.  
Corrosion inhibitor.  
Coatings

### 1.3 Details of the supplier of the safety data sheet

Ashland  
P.O. Box 8619  
NL3009 AP, Rotterdam  
Netherlands  
EUSMT@ashland.com

### 1.4 Emergency telephone number

00-800-274-5263-3/001-606-329-5701 , or  
contact your local emergency telephone  
number at 112

#### Product Information

+31 10 497 5000 (in the Netherlands), or  
contact your local CSR contact person

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

#### Classification (REGULATION (EC) No 1272/2008)

Flammable liquids, Category 2

H225: Highly flammable liquid and vapour.

Acute toxicity, Category 4

H302: Harmful if swallowed.

Eye irritation, Category 2

H319: Causes serious eye irritation.

Carcinogenicity, Category 2

H351: Suspected of causing cancer.

Specific target organ toxicity - single exposure, Category 3, Respiratory system

H335: May cause respiratory irritation.

**Classification (67/548/EEC, 1999/45/EC)**

Highly flammable

R11: Highly flammable.

Carcinogenic Category 3

R19: May form explosive peroxides.

Harmful

R40: Limited evidence of a carcinogenic effect.

Irritant

R22: Harmful if swallowed.

R36/37: Irritating to eyes and respiratory system.

**2.2 Label elements****Labelling (REGULATION (EC) No 1272/2008)**

Hazard pictograms



Signal word

: Danger

Hazard statements

: H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.

Precautionary statements

: **Prevention:**

P201 Obtain special instructions before use.  
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
P233 Keep container tightly closed.  
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.  
P281 Use personal protective equipment as required.

**Response:**

P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Hazardous components which must be listed on the label:

109-99-9 tetrahydrofuran

**Additional Labelling:**

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EUH019 May form explosive peroxides.

**2.3 Other hazards**

Assessment : PBT substance , vPvB substance - not determined

**SECTION 3: Composition/information on ingredients****3.1 Substances**

Chemical Name	CAS-No. EINECS-No. / ELINCS No.	Concentration [%]
tetrahydrofuran	109-99-9 203-726-8	>= 90 - <= 100

**SECTION 4: First aid measures****4.1 Description of first aid measures**

General advice : Move out of dangerous area.  
Consult a physician.  
Show this safety data sheet to the doctor in attendance.

If inhaled : Move to fresh air.  
If symptoms persist, call a physician.  
In case of shortness of breath, give oxygen.

In case of skin contact : Take off contaminated clothing and shoes immediately.  
Wash off immediately with plenty of water.  
Wash contaminated clothing before re-use.  
If skin irritation persists, call a physician.

In case of eye contact : Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.  
Remove contact lenses.

If swallowed : Do not induce vomiting without medical advice.  
Never give anything by mouth to an unconscious person.  
Consult a physician if necessary.

**4.2 Most important symptoms and effects, both acute and delayed**

Symptoms : Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:  
stomach or intestinal upset (nausea, vomiting, diarrhea)  
irritation (nose, throat, airways)

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central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness)

Risks : no data available

#### 4.3 Indication of any immediate medical attention and special treatment needed

Treatment : no data available

### SECTION 5: Firefighting measures

#### 5.1 Extinguishing media

Suitable extinguishing media : ABC powder  
Carbon dioxide (CO2)  
Dry chemical  
Water spray

Unsuitable extinguishing media : Halons

#### 5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : carbon dioxide and carbon monoxide  
Hydrocarbons

#### 5.3 Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

Further information : Use water spray to cool unopened containers.  
Prevent fire extinguishing water from contaminating surface water or the ground water system.  
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.  
For safety reasons in case of fire, cans should be stored separately in closed containments.

### SECTION 6: Accidental release measures

#### 6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Persons not wearing protective equipment should be excluded

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from area of spill until clean-up has been completed.  
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.  
Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks).  
Pay attention to the spreading of gases especially at ground level (heavier than air) and to the direction of the wind.  
Evacuate personnel to safe areas.

## 6.2 Environmental precautions

Environmental precautions : Prevent further leakage or spillage if safe to do so.

## 6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).  
Keep in suitable, closed containers for disposal.

## 6.4 Reference to other sections

no data available

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Advice on safe handling : Do not breathe vapours or spray mist.  
Avoid contact with skin and eyes.  
For personal protection see section 8.  
Provide sufficient air exchange and/or exhaust in work rooms.  
Avoid exceeding of the given occupational exposure limits (see section 8).  
Smoking, eating and drinking should be prohibited in the application area.  
Ensure all equipment is electrically grounded and bonded before beginning transfer operations.

Advice on protection against fire and explosion : Take measures to prevent the build up of electrostatic charge.  
Mixture may charge electrostatically: always use earthing leads when transferring from one container to another.  
Keep product and empty container away from heat and sources of ignition.  
No sparking tools should be used.  
Avoid formation of aerosol.

### 7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage : Store in original container.

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areas and containers

Keep containers tightly closed in a dry, cool and well-ventilated place.  
Containers which are opened must be carefully resealed and kept upright to prevent leakage.  
Electrical installations / working materials must comply with the technological safety standards.

Other data

: Stable under recommended storage conditions.

**7.3 Specific end use(s)**

no data available

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**SECTION 8: Exposure controls/personal protection****8.1 Control parameters**

Components	CAS-No.	Value type	Form of Exposure	Control parameters	Update	Basis
tetrahydrofuran	109-99-9	TWA		50 ppm 150 mg/m <sup>3</sup>	2007	EH40 WEL
tetrahydrofuran	109-99-9	STEL		100 ppm 300 mg/m <sup>3</sup>	2007	EH40 WEL

**8.2 Exposure controls****Engineering measures**

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below level of overexposure (from known, suspected or apparent adverse effects).

**Personal protective equipment**

Respiratory protection : When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection : Wear impervious gloves (consult your safety equipment supplier).

: Nitrile rubber  
butyl-rubber

Eye protection : Safety glasses with side-shields

Skin and body protection : Wear as appropriate:

Safety shoes  
Flame-resistant clothing

Hygiene measures : Keep away from food, drink and animal feedingstuffs.  
When using do not eat, drink or smoke.  
Ensure that eyewash stations and safety showers are close to the workstation location.

**Environmental exposure controls**

General advice : Prevent further leakage or spillage if safe to do so.

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**SECTION 9: Physical and chemical properties****9.1 Information on basic physical and chemical properties**

Appearance : liquid  
Colour : clear  
Odour : ether-like  
Odour Threshold : no data available  
pH : no data available  
Freezing point / Melting point : -108,5 °C  
  
Boiling point : 66 °C  
  
Flash point : -21,2 °C  
  
Evaporation rate : no data available  
Flammability (solid, gas) : no data available  
Burning rate : no data available  
Lower explosion limit : no data available  
Upper explosion limit : no data available  
Vapour pressure : 170 hPa; 20 °C  
  
Relative vapour density : no data available  
Relative density : no data available  
Density : 0,886 g/cm<sup>3</sup>; 25 °C

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Water solubility	: soluble
Solubility in other solvents	: no data available
Partition coefficient: n-octanol/water	: log Pow: 0,45; 25 °C
Auto-ignition temperature	: 215 °C
Ignition temperature	: no data available
Thermal decomposition	: no data available
Viscosity, dynamic	: 0,456 mPa.s; 25 °C
Viscosity, kinematic	: no data available
Explosive properties	: no data available
Oxidizing properties	: no data available

## 9.2 Other information

Bulk density	: no data available
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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Hazardous polymerisation does not occur.

### 10.2 Chemical stability

Stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

Hazardous reactions	: Further information: Stable under recommended storage conditions.
	: Hazardous polymerisation does not occur. Vapours may form explosive mixture with air.

### 10.4 Conditions to avoid

Conditions to avoid	: Heat, flames and sparks.
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Exposure to moisture.  
Heating in air.

**10.5 Incompatible materials**

Materials to avoid : Acids  
Strong oxidizing agents

**10.6 Hazardous decomposition products**

Hazardous decomposition products : carbon dioxide and carbon monoxide  
Hydrocarbons

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**SECTION 11: Toxicological information****11.1 Information on toxicological effects****Product**

Acute oral toxicity : no data available

Acute inhalation toxicity : no data available

Acute dermal toxicity : no data available

Skin corrosion/irritation : no data available

Serious eye damage/eye irritation : no data available

Respiratory or skin sensitisation : no data available

**Components:****tetrahydrofuran :**

Acute oral toxicity : LD 50: 1.650 mg/kg, Rat

Acute inhalation toxicity : LC 50: > 14,7 mg/l, 6 h, Rat,

Acute dermal toxicity : LD 50: > 2.000 mg/kg, Rat

Respiratory or skin sensitisation : mouse

Germ cell mutagenicity

Genotoxicity in vitro : Ames test, Result: negative

Genotoxicity in vitro : Chromosome aberration test in vitro, Result: negative  
Genotoxicity in vivo : In vivo micronucleus test, mouse, Result: negative

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**SECTION 12: Ecological information****12.1 Toxicity**

**Product:**  
no data available

**Components:**  
no data available

**12.2 Persistence and degradability**

**Product:**  
no data available

**Components:**  
**tetrahydrofuran :**  
Biodegradability : 63 %, Exposure time: 48 d, Inherently biodegradable

**12.3 Bioaccumulative potential**

**Product:**  
Bioaccumulation : The substance has low potential for bioaccumulation.

**Components:**  
**tetrahydrofuran :**  
Bioaccumulation : Bioconcentration factor (BCF): 3,16

**12.4 Mobility in soil**

**Product:**  
no data available

**Components:**  
no data available

**12.5 Results of PBT and vPvB assessment**

**Product:**  
no data available

**Components:**  
no data available

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## 12.6 Other adverse effects

### Product:

no data available

### Components:

no data available

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

Product	: Dispose of in accordance with the European Directives on waste and hazardous waste.
	: Do not contaminate ponds, waterways or ditches with chemical or used container. Container hazardous when empty. Dispose of in accordance with local regulations.
Contaminated packaging	: Empty remaining contents. Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

## SECTION 14: Transport information

### 14.1 UN number

**ADR:** UN2056

**ADNR:** UN2056

**RID:** UN2056

**INTERNATIONAL MARITIME DANGEROUS GOODS:** UN2056

**INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO:** UN2056

**INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER:** UN2056

### 14.2 UN proper shipping name

**ADR:** TETRAHYDROFURAN

**ADNR:** TETRAHYDROFURAN

**RID:** TETRAHYDROFURAN

**INTERNATIONAL MARITIME DANGEROUS GOODS:** TETRAHYDROFURAN

**INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO:** Tetrahydrofuran

**INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER:** Tetrahydrofuran

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#### 14.3 Transport hazard class(es)

ADR: 3

ADNR: 3

RID: 3

INTERNATIONAL MARITIME DANGEROUS GOODS: 3

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO: 3

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER: 3

#### 14.4 Packing group

ADR: II

ADNR: II

RID: II

INTERNATIONAL MARITIME DANGEROUS GOODS: II

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO: II

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER: II

#### 14.5 Environmental hazards

ADR: not applicable

ADNR: not applicable

RID: not applicable

INTERNATIONAL MARITIME DANGEROUS GOODS: not applicable

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO: not applicable

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER: not applicable

#### 14.6 Special precautions for user

Not applicable

#### 14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Ship Type: Not applicable

Hazard code(s): Not applicable

Pollutant Category: Not applicable

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

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### SECTION 15: Regulatory information

#### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso II - Directive 2003/105/EC amending Council Directive 96/82/EC on the control of major-

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accident hazards involving dangerous substances

Hazard class	Number	Quantity 1	Quantity 2
Highly flammable	7b	5.000 t	50.000 t

**Notification status**

US. Toxic Substances Control Act	y (positive listing)
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133)	y (positive listing)
Australia. Industrial Chemical (Notification and Assessment) Act	y (positive listing)
Japan. ENCS - Existing and New Chemical Substances Inventory	y (positive listing)
Korea. Toxic Chemical Control Law (TCCL) List	y (positive listing)
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	y (positive listing)
China. Inventory of Existing Chemical Substances	y (positive listing)

**15.2 Chemical Safety Assessment**

no data available

**SECTION 16: Other information****Full text of R-phrases referred to under sections 2 and 3**

R11	Highly flammable.
R19	May form explosive peroxides.
R22	Harmful if swallowed.
R36/37	Irritating to eyes and respiratory system.
R40	Limited evidence of a carcinogenic effect.

**Full text of H-Statements referred to under sections 2 and 3.**

H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.

**Further information**

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**Other information**

: The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This SDS has been prepared by Ashland's Environmental Health and Safety Department (+31 10 497 5000).

List of abbreviations and acronyms that could be, but not necessarily are, used in this safety data sheet :

ACGIH : American Conference of Industrial Hygienists

BEI : Biological Exposure Index

CAS : Chemical Abstracts Service (Division of the American Chemical Society).

CMR : Carcinogenic, Mutagenic or Toxic for Reproduction

FG : Food grade

GHS : Globally Harmonized System of Classification and Labeling of Chemicals.

H-statement : Hazard Statement

IATA : International Air Transport Association.

IATA-DGR : Dangerous Goods Regulation by the "International Air Transport Association" (IATA).

ICAO : International Civil Aviation Organization

ICAO-TI (ICAO) : Technical Instructions by the "International Civil Aviation Organization"

IMDG : International Maritime Code for Dangerous Goods

ISO : International Organization for Standardization

logPow : octanol-water partition coefficient

LC<sub>xx</sub> : Lethal Concentration, for xx percent of test population

LD<sub>xx</sub> : Lethal Dose, for xx percent of test population.

IC<sub>xx</sub> : Inhibitory Concentration for xx of a substance

Ec<sub>xx</sub> : Effective Concentration of xx

N.O.S.: Not Otherwise Specified

OECD : Organization for Economic Co-operation and Development

OEL : Occupational Exposure Limit

P-Statement : Precautionary Statement

PBT : Persistent , Bioaccumulative and Toxic

PPE : Personal Protective Equipment

STEL : Short-term exposure limit

STOT : Specific Target Organ Toxicity

TLV : Threshold Limit Value

TWA : Time-weighted average

vPvB : Very Persistent and Very Bioaccumulative

WEL : Workplace Exposure Level

ABM : Water Hazard Class for the Netherlands

ADR : Agreement concerning the International Carriage of Dangerous Goods by Road.

ADNR: Regulation for the Carriage of Dangerous Substances on the Rhine

CLP : Classification, Labelling and Packaging

CSA : Chemical Safety Assessment

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CSR : Chemical Safety Report

DNEL : Derived No Effect Level.

EINECS : European Inventory of Existing Commercial Chemical Substances.

ELINCS : European List of Notified Chemical Substances

PEC : Predicted Effect Concentration

PEL : Permissible Exposure Limits

PNEC : Predicted No Effect Concentration

R-phrase : Risk phrase

REACH : Registration, Evaluation, Authorisation and Restriction of Chemicals

RID : Regulation Concerning the International Transport of Dangerous Goods by Rail

S-phrase: Safety phrase

WGK : German Water Hazard Class