

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Honeywell

Riedel-de Haën™

Tetrahydrofuran

87368-2.5L

Version 1.3

Revision Date 11.06.2022

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

1.1. Product identifier

Product name : Tetrahydrofuran
SDS-number : 000000016194
Type of product : Substance
Remarks : SDS according to Art. 31 of Regulation (EC) 1907/2006.

Chemical name : tetrahydrofuran
Index-No. : 603-025-00-0
REACH Registration Number : no data available

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

Use of the Substance/Mixture : Laboratory chemicals

Uses advised against : none

1.3. Details of the supplier of the safety data sheet

Company	: Honeywell International Inc. 115 Tabor Road 07950-2546 Morris Plains USA	Honeywell International, Inc. 115 Tabor Road Morris Plains, NJ 07950-2546 USA
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Telephone :
For further information, please contact: : SafetyDataSheet@Honeywell.com

1.4. Emergency telephone number

Emergency telephone number : +1-703-527-3887 (ChemTrec-Transport)
+1-303-389-1414 (Medical)
Country based Poison Control Center : see chapter 15.1

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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

REGULATION (EC) No 1272/2008

Flammable liquids Category 2
H225 Highly flammable liquid and vapour.
Acute toxicity Category 4 - Oral
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.

2.2. Label elements

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.
EUH019 May form explosive peroxides.

Precautionary statements : P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water

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P308 + P313

for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/ attention.

2.3. Other hazards

Highly flammable. Take measures to prevent the build up of electrostatic charge. Protect from exposure to air/oxygen.

SECTION 3: Composition/information on ingredients

3.1. Substance

Chemical name	CAS-No. Index-No. REACH Registration Number EC-No.	Classification 1272/2008	Concentration	Remarks
tetrahydrofuran	109-99-9 603-025-00-0 203-726-8	Flam. Liq. 2; H225 Acute Tox. 4; H302; Oral Eye Irrit. 2; H319 Carc. 2; H351 STOT SE 3; H335; Respiratory system EUH019	< 100 %	Eye Irrit. 2; H319:>= 25 % STOT SE 3; H335:>= 25 %

3.2. Mixture

Not applicable

Occupational Exposure Limit(s), if available, are listed in Section 8.
For the full text of the H-Statements mentioned in this Section, see Section 16.

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SECTION 4: First aid measures

4.1 Description of first aid measures

General advice:

First aider needs to protect himself. Move out of dangerous area. Take off all contaminated clothing immediately. If unconscious, place in recovery position and seek medical advice.

Inhalation:

If inhaled, remove to fresh air. Call a physician if irritation develops or persists.

Skin contact:

After contact with skin, wash immediately with plenty of water.

Eye contact:

Protect unharmed eye. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

Ingestion:

Rinse mouth with water. Do NOT induce vomiting. Call a physician immediately.

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

No data available

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

No data available

See Section 11 for more detailed information on health effects and symptoms.

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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Water spray
Foam
Carbon dioxide (CO₂)
Dry powder

Extinguishing media which shall not be used for safety reasons:

High volume water jet

5.2. Special hazards arising from the substance or mixture

Vapours may form explosive mixtures with air.
May form explosive peroxides.
Fire may cause evolution of:
Carbon oxides

5.3. Advice for firefighters

In the event of fire, wear self-contained breathing apparatus.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas. Ensure adequate ventilation. Remove all sources of ignition. Wear personal protective equipment. Unprotected persons must be kept away. Avoid contact with skin and eyes.

6.2. Environmental precautions

Do not let product enter drains. Should not be released into the environment.

6.3. Methods and materials for containment and cleaning up

Dilute with plenty of water.
Soak up with inert absorbent material.

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Pick for disposal in tightly closed containers

6.4. Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling:

Exhaust ventilation at the object is necessary.

Advice on protection against fire and explosion:

Keep away from sources of ignition - No smoking. Use only in explosion-proof areas. The heavy vapours can overcome a considerable distance up to the source of ignition.

Hygiene measures:

Take off all contaminated clothing immediately. Remove and wash contaminated clothing before re-use. Keep working clothes separately. Wash hands before breaks and at the end of workday. When using do not eat, drink or smoke.

Temperature class:

T3

7.2. Conditions for safe storage, including any incompatibilities

Further information on storage conditions:

Store in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from exposure to air/oxygen (peroxide formation).

7.3. Specific end use(s)

no additional data available

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits:

Components	Basis / Value type	Value / Form of exposure	Exceeding Factor	Remarks
tetrahydrofuran	EU ELV SKIN_DES			Can be absorbed through the skin.
tetrahydrofuran	EH40 WEL TWA	150 mg/m3 50 ppm		
tetrahydrofuran	EH40 WEL SKIN_DES			Can be absorbed through the skin.
tetrahydrofuran	EH40 WEL STEL	300 mg/m3 100 ppm		
tetrahydrofuran	EH40 WEL			Listed
tetrahydrofuran	EU ELV STEL	300 mg/m3 100 ppm		Indicative
tetrahydrofuran	EU ELV TWA	150 mg/m3 50 ppm		Indicative

SKIN_DES - Skin designation:
TWA - Time weighted average
STEL - Short term exposure limit

DNEL/ PNEC-Values

Component	End-use/impact	Exposure duration	Value	Exposure routes	Remarks
tetrahydrofuran	Workers / Long-term systemic effects		72,4 mg/m3	Inhalation	
tetrahydrofuran	Workers / Acute systemic effects		96 mg/m3	Inhalation	
tetrahydrofuran	Workers / Long-term local effects		150 mg/m3	Inhalation	

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tetrahydrofuran	Workers / Acute local effects		300 mg/m ³	Inhalation	
tetrahydrofuran	Workers / Long-term systemic effects		12,6mg/kg bw/d	Skin contact	
tetrahydrofuran	Consumers / Long-term systemic effects		13 mg/m ³	Inhalation	
tetrahydrofuran	Consumers / Acute systemic effects		52 mg/m ³	Inhalation	
tetrahydrofuran	Consumers / Long-term local effects		75 mg/m ³	Inhalation	
tetrahydrofuran	Consumers / Acute local effects		150 mg/m ³	Inhalation	
tetrahydrofuran	Consumers / Long-term systemic effects		1,5mg/kg bw/d	Skin contact	
tetrahydrofuran	Consumers / Long-term systemic effects		1,5mg/kg bw/d	Ingestion	

Component	Environmental compartment / Value	Remarks
tetrahydrofuran	Fresh water: 4,32 mg/l	Assessment factor: 50
tetrahydrofuran	Marine water: 0,432 mg/l	Assessment factor: 500
tetrahydrofuran	Sewage treatment plant: 4,6 mg/l	Assessment factor: 100
tetrahydrofuran	Fresh water sediment: 23,3 mg/kg dw	

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tetrahydrofuran	Marine sediment: 2,33 mg/kg dw	
tetrahydrofuran	Soil: 2,13 mg/kg dw	

8.2. Exposure controls

Occupational exposure controls

The Personal Protective Equipment must be in accordance with EN standards:respirator EN 136, 140, 149; safety glasses EN 166; protective suit: EN 340, 463, 468, 943-1, 943-2; gloves EN 374, 511; safety shoes EN-ISO 20345.

Do not breathe vapours or spray mist.

Personal protective equipment

Respiratory protection:

In the case of vapour formation use a respirator with an approved filter.

Hand protection:

Glove material: Viton®

Break through time: > 10 min

Glove thickness: 0,7 mm

Vitoject® 890

Gloves must be inspected prior to use.

Replace when worn.

Remarks:Supplementary note: The specifications are based on information and tests from similar substances by analogy.

Due to varying conditions (e.g.temperature or other strains) it must be considered that the usage of a chemical protective glove in practice may be much shorter than the permeation time determined in accordance with EN 374.

Since actual conditions of practical use often deviate from standardised conditions according EN 374 the glove manufacturer recommends to use the chemical protective glove in practice not longer than 50% of the recommended permeation time.

Manufacturer's directions for use should be observed because of great diversity of types .

Suitable gloves tested according EN 374 are supplied e.g. from KCL GmbH, D-36124 Eichenzell, Vertrieb@kcl.de

Eye protection:

Safety goggles

Skin and body protection:

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Protective suit

Environmental exposure controls

Handle in accordance with local environmental regulations and good industrial practices.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: liquid
Colour	: colourless
Odour	: characteristic acetone-like
molecular weight	: 72,11 g/mol
Melting point/range	: -108 °C
Boiling point/boiling range	: 65 °C at 1.013 hPa
Flammability	: No data available
Upper explosion limit	: 12 %(V)
Lower explosion limit	: 1,5 %(V)
Flash point	: -21 °C
Auto-ignition temperature	: 215 °C Method: DIN 51794
Decomposition temperature	: May form explosive peroxides.
pH	: neutral
Viscosity, kinematic	: No data available
Water solubility	: completely miscible

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Solubility in other solvents : Soluble in most organic solvents

Partition coefficient: n-
octanol/water : log Pow 0,45
at: 20 °C

Vapour pressure : 200 hPa
at 20 °C

Density : 0,89 g/cm³
at 20 °C

Relative vapour density : No data available

9.2 Other Information

Oxidizing properties : The substance or mixture is not classified as oxidizing.

Evaporation rate : No data available

Viscosity, dynamic : 0,48 mPa.s
at 20 °C

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under recommended storage conditions.

10.2. Chemical stability

May form explosive peroxides.

10.3. Possibility of hazardous reactions

Vapours may form explosive mixture with air.

10.4. Conditions to avoid

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Heat, flames and sparks.
Protect from exposure to air/oxygen (peroxide formation).

10.5. Incompatible materials

Oxidizing agents
Strong acids and strong bases

10.6. Hazardous decomposition products

Carbon oxides

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute oral toxicity:

LD50

Species: Rat

Value: 1.650 mg/kg

Acute dermal toxicity:

LD50

Species: Rat

Value: > 2.000 mg/kg

Method: OECD Test Guideline 402

Acute inhalation toxicity:

LC50

Species: Rat

Value: > 14,7 mg/l

> 5000 ppm

Exposure time: 6 h

Skin irritation:

Species: Rabbit

Result: Mild skin irritation

According to the classification criteria of the European Union, the product is not considered as being a skin irritant.

Eye irritation:

Classification based on Annex VI of regulation 1272/2008/EC.

Respiratory or skin sensitisation:

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Mouse local lymph node assay

Species: Mouse

Classification: non-sensitizing

Method: OECD 429

Repeated dose toxicity:

Species: Rat

Application Route: Oral

Exposure time: 4 Weeks

NOAEL: 1.000 mg/l

Method: OECD Test Guideline 407

Carcinogenicity:

Note: Classification based on Annex VI of regulation 1272/2008/EC.

Germ cell mutagenicity:

Test Method: Chromosome aberration test in vitro

Metabolic activation: with and without metabolic activation

Result: negative

Method: OECD Test Guideline 473

Test Method: In vitro gene mutation study in mammalian cells

Metabolic activation: with and without metabolic activation

Result: negative

Method: OECD Test Guideline 476

Test Method: Ames test

Metabolic activation: with and without metabolic activation

Result: negative

Method: OECD Test Guideline 471

Test Method: Chromosome aberration test

Species: Mouse

Method: OECD Test Guideline 474

Result: negative

Reproductive toxicity:

Remarks: Not classified due to data which are conclusive although insufficient for classification.

Aspiration hazard:

May be fatal if swallowed and enters airways.

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11.2. Information on other hazards

Endocrine disrupting properties
No data available

Other information:
No data available

SECTION 12: Ecological information

12.1. Toxicity

Toxicity to fish:

LC50
flow-through test
Species: Pimephales promelas (fathead minnow)
Value: 2.160 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

NOEC

Species: Pimephales promelas (fathead minnow)
Value: 216 mg/l
Exposure time: 33 d

Toxicity to aquatic plants:

Growth rate
Species: Scenedesmus quadricauda (Green algae)
Value: 3.700 mg/l
Exposure time: 8 d

Toxicity to Microorganisms:

IC50
static test
Species: activated sludge
Value: 460 mg/l
Exposure time: 3 h
Method: OECD 209

Toxicity to aquatic invertebrates:

EC50
static test

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Species: Daphnia magna (Water flea)

Value: 5.930 mg/l

Method: DIN 38412

EC50

static test

Species: Daphnia magna (Water flea)

Value: 3485 ppm

Method: OECD Test Guideline 202

12.2. Persistence and degradability

Biodegradability:

Result: Not readily biodegradable.

Method: OECD 301 D

12.3. Bioaccumulative potential

No data available

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

No data available

12.6. Endocrine disrupting properties

No data available

12.7. Other adverse effects

Chemical Oxygen Demand : Value: 1,6 mg/g
(COD)

Do not flush into surface water or sanitary sewer system.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product:

Dispose according to legal requirements.

Packaging:

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Legal requirements are to be considered in regard of reuse or disposal of used packaging materials

Further information:

Provisions relating to waste:
EC Directive 2006/12/EC; 2008/98/EEC
Regulation No. 1013/2006

For personal protection see section 8.

SECTION 14: Transport information

14.1 UN number

ADR/RID:2056

IMDG:2056

IATA:2056

14.2 UN proper shipping name

ADR/RID:TETRAHYDROFURAN

IMDG:TETRAHYDROFURAN

IATA:Tetrahydrofuran

14.3 Transport hazard class(es)

ADR/RID: 3

IMDG: 3

IATA: 3

14.4 Packaging group

ADR/RID: II

IMDG: II

IATA: II

14.5 Environmental hazards

ADR/RID:no

Marine pollutant: no

14.6 Special precautions for user

No data available

14.7 Maritime transport in bulk according to IMO instruments

No data available

SECTION 15: Regulatory information

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

Basis	Value	Remarks
Directive 2012/18/EC Listed in Regulation : P5c: FLAMMABLE LIQUIDS Number in Regulation: 1.2.5.3	Quantity: 5.000.000 kg Quantity: 50.000.000 kg	

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Substances of very high concern (SVHC)		This product does not contain substances of very high concern according to Regulation (EC) No Article 57 above the respective regulatory 1907/2006 (REACH), concentration limit of $\geq 0.1\%$ (w/w).
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Poison Control Center

Country	Phone Number
Austria	+4314064343
Belgium	070 245245
Bulgaria	(+35929154233
Croatia	(+3851)23-48-342
Cyprus	+357 2240 5611
Czech Republic	+420224919293; +420224915402
Denmark	82121212
Estonia	16662; (+372)6269390
Finland	9471977
France	+33(0)145425959
Greece	+30 210 779 3777
Hungary	(+36-80)201-199
Iceland	5432222
Ireland	+353(1)8092166
Italy	0382 24444
Germany	Berlin : 030/19240
	Bonn : 0228/19240
	Erfurt : 0361/730730
	Freiburg : 0761/19240
	Göttingen : 0551/19240
Homburg : 06841/19240	

Country	Phone Number
Liechtenstein	+41 442515151
Lithuania	+370532362052
Luxembourg	070245245; (+352)80002-5500
Malta	+356 2395 2000
Netherlands	030-2748888
Norway	22591300
Poland	+48 42 25 38 400
Portugal	800250250
Romania	+40 21 318 3606
Slovakia (NTIC)	+421 2 54 774 166
Slovenia	+386 1 400 6051
Spain	+34915620420
Sweden	112 (begär Gifinformation);+46104566786
Switzerland	145
United Kingdom	(+44) 844 892 0111

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	Mainz : 06131/19240
	Munich : 089/19240
Latvia	+37167042473

Other inventory information

US. Toxic Substances Control Act
On TSCA Inventory

Australia. Industrial Chemicals Act (AIC), as amended
On the inventory, or in compliance with the inventory

Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL)
All components of this product are on the Canadian DSL

Japan. Kashin-Hou Law List
On the inventory, or in compliance with the inventory

Korea. Existing Chemicals Inventory (KECI)
On the inventory, or in compliance with the inventory

Philippines. Inventory of Chemicals and Chemical Substances (PICCS)
On the inventory, or in compliance with the inventory

China. Inventory of Existing Chemical Substances (IECSC)
On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand
On the inventory, or in compliance with the inventory

Taiwan Chemical Substance Inventory (TCSI)
On the inventory, or in compliance with the inventory

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Text of H-statements referred to under heading 3

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tetrahydrofuran	:	H225	Highly flammable liquid and vapour.
		H302	Harmful if swallowed.
		H319	Causes serious eye irritation.
		H351	Suspected of causing cancer.
		H335	May cause respiratory irritation.
		EUH019	May form explosive peroxides.
2,6-di-tert-Butyl-p-cresol (Stabilizer)	:	H400	Very toxic to aquatic life.
		H410	Very toxic to aquatic life with long lasting effects.

Further information

All directives and regulations refer to amended versions.
Vertical lines in the left hand margin indicate a relevant amendment from the previous version.

Abbreviations:

EC European Community
CAS Chemical Abstracts Service
DNEL Derived no effect level
PNEC Predicted no effect level
vPvB Very persistent and very bioaccumulative substance
PBT Persistent, bioaccumulative und toxic substance

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user.

This information should not constitute a guarantee for any specific product properties.
