1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trichloraethylenum

Item-No. 15720000

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

Use of the substance/preparation

Industrial solvent

1.3. Details of the supplier of the safety data sheet

Address

Hänseler AG
Industriestrasse 35
9101 Herisau

Telephone no.	0041 (0)71 353 58 58
E-mail address of person responsible for this SDS	sdb@haenseler.ch

1.4. Emergency telephone number

Switzerland :145 / Abroad +41 (0)44 251 51 51

2. Hazards identification ***

2.1. Classification of the substance or mixture

Classification (Regulation (EC) No. 1272/2008)

Classification (Regulation (EC) No. 1272/2008)

Carc. 1B	H350
Muta. 2	H341
Eye Irrit. 2	H319
Skin Irrit. 2	H315
STOT SE 3	H336
Aquatic Chronic 3	H412
Skin Sens. 1	H317

Classification in accordance with EC directives

Classification

Carc.Cat.2, R45
Xi, R36/38
R52/53
R67
Muta.Cat.3, R68

2.2. Label elements

Labelling according to regulation (EC) No 1272/2008

Hazard pictograms

Signal word

Danger

Hazard statements ***

H350	May cause cancer.
H341	Suspected of causing genetic defects.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statements ***

P202	Do not handle until all safety precautions have been read and understood.
P261.2	Avoid breathing mist/vapours/spray.
P281	Use personal protective equipment as required.
P273	Avoid release to the environment.
P308+P313	IF expsoed or concerned: Get medicinal advice/attention.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Labelling in accordance with EC directives 1999/45/EC and 67/548/EEC

The product is classified and labelled in accordance with EC directives/the relevant national laws.

Hazard symbols

Toxic

R phrases ***

45	May cause cancer.
36/38	Irritating to eyes and skin.
52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
67	Vapours may cause drowsiness and dizziness.

S phrases

45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
53	Avoid exposure - obtain special instructions before use.
61	Avoid release to the environment. Refer to special instructions/Safety data sheets.

Hazardous component(s) to be indicated on label

contains 1,2-Epoxybutane;Trichloroethylene

Special labelling for certain preparations

"Restricted to professional users"
Contains epoxy-containing compounds. Observe manufacturer's instructions.

3. Composition/information on ingredients

Chemical characterization

Trichloraethylenum

Molecular weight

Value	131.4	g/mol

Hazardous ingredients

Trichloroethylene

CAS No.	79-01-6			
EINECS no.	201-167-4			
Concentration		>=	50	%
Classification	Carc.Cat.2, R45 Xi, R36/38 R52/53 R67			

Classification (Regulation (EC) No. 1272/2008)

STOT SE 3	H336
Muta. 2	H341
Aquatic Chronic 3	H412
Eye Irrit. 2	H319
Carc. 1B	H350
Skin Irrit. 2	H315
Skin Sens. 1	H317

1,2-Epoxybutane

CAS No.	106-88-7			
EINECS no.	203-438-2			
Concentration	>= 1	<	10	%
Classification	Carc.Cat.3, R40 Xn, R20/21/22 Xi, R36/37/38 F, R11 R52/53			

Classification (Regulation (EC) No. 1272/2008)

Eye Irrit. 2	H319
Aquatic Chronic 3	H412
Skin Irrit. 2	H315
STOT SE 3	H335
Carc. 2	H351
Acute Tox. 4	H332
Acute Tox. 4	H312
Flam. Liq. 2	H225
Acute Tox. 4	H302

4. First aid measures

4.1. Description of first aid measures

General information

Remove affected person from danger area, lay him down. Remove contaminated clothing immediately and dispose of safely. Adhere to personal protective measures when giving first aid. Poisonous symptoms can first be observed after several hours, there- fore medical observation for at least 48 hours is necessary.

After inhalation

Remove the casualty into fresh air and keep him calm. Irregular breathing/no breathing: artificial respiration. If necessary, give oxygen. If the patient is likely to become unconscious, place and transport in stable sideways position. Summon a doctor immediately.

After skin contact

In case of contact with skin wash off immediately with plenty of water.

After eye contact

Remove contact lenses. In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. By continuous complaints consult a physician.

After ingestion

Do not induce vomiting. Administer activated charcoal and sodium sulfate. Summon a doctor immediately.

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

Headache, Nausea, Cardiovascular disturbance, CNS Disturbance, Convulsions, Intoxication, Narcosis

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

Hints for the physician / treatment

If swallowed, in the event of vomiting, risk of product entering the lungs. Symptomatic treatment, no specific antidote known.

Hints for the physician / hazards

Risk of pulmonary oedema

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Water mist, Dry chemical extinguisher, Carbon dioxide, Foam

5.2. Special hazards arising from the substance or mixture

In the event of fire the following can be released: Carbon monoxide (CO); Carbon dioxide (CO2); Phosgene; Hydrogen chloride (HCl); Chlorine (Cl2); If a fire breaks out nearby, pressure build-up and danger of bursting are possible. Vapours heavier than air.

5.3. Advice for firefighters

Special protective equipment for fire-fighting

Use self-contained breathing apparatus. Wear full protective suit.

Other information

Cool endangered containers with water spray jet. Collect contaminated fire-fighting water separately, must not be discharged into the drains.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep away unprotected persons. Keep people away and stay on the upwind side.

6.2. Environmental precautions

Do not discharge into the drains/surface waters/groundwater. Advise water authority if spillage has entered water course or drainage system. Prevent spread over a wide area (e.g. by containment or oil barriers). Suppress gases/vapours/mists with water spray jet. Retain and dispose of contaminated wash water.

6.3. Methods and material for containment and cleaning up

Send in suitable containers for recovery or disposal. Pick up with absorbent material (eg sand, kieselgur, acid binder, universal binder, sawdust). Ensure adequate ventilation.

7. Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Provide good ventilation of working area (local exhaust ventilation if necessary). Provide good room ventilation even at ground level (vapours are heavier than air). Open and handle container with care. Avoid formation of aerosols. Transfer and handle in enclosed systems is recommended. Avoid inhaling dusts/ billows/ steams. Do not swallow. Avoid contact with skin, eyes and clothing. Keep container tightly closed.

Advice on protection against fire and explosion

Keep away from sources of ignition - refrain from smoking.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep in a dry place. Keep in a cool place. Use viton-coated containers and pinings. Use steel or stainless steel containers. Do not usecontainers and pinings made of traditionally synthetic materials. Do not store or transport in containers made of light metals or alloys.

Hints on storage assembly

Do not store with oxidizing agents. Do not store together with: Alkalies

Further information on storage conditions

Keep under lock and key or accessible only to specialists or people who are authorized. Keep container tightly closed. Protect from atmospheric moisture and water. Protect from heat and direct sunlight. Keep container in a well-ventilated place.

8. Exposure controls/personal protection

8.1. Control parameters

Exposure limit values

1,2-Epoxybutane

List	SUVA			
Type	MAK			

Skin resorption / sensibilisation: H; Status: 2012

Trichloroethylene

List	SUVA			
Type	MAK			
Value	260	mg/m³	50	ppm(V)
Short term exposure limit	520	mg/m³	100	ppm(V)

Maximum limit value: 4x15; Skin resorption / sensibilisation: H; Status: 2012; Remarks: B

8.2. Exposure controls

Exposure controls

See chapter 7. No measures exeeding the ones mentioned are necessary.

General protective and hygiene measures

Keep away from food-stuffs, beverages and feed-stocks. Wash hands before breaks and after work. At work do not eat, drink, smoke or take drugs. Avoid contact with eyes and skin. Do not inhale gases/vapours/aerosols.

Respiratory protection

Breathing apparatus in the event of vapours. Gas filterA. At intensive and longer exposition use self-contained breathing apparatus.

Hand protection

Butyl rubber gloves
Penetrating time > 120 min
Neoprene gloves
Penetrating time > 120 min
Gloves of nitrile rubber - NBR
Penetrating time > 120 min
Not suitable: PVC gloves

Eye protection

Tightly fitting safety glasses

Body protection

Impermeable protective clothing

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	liquid				
Colour	clear				
Odour	characteristic				
pH					
Remarks	Not applicable				
Melting point					
Value	-	84.8			℃
Freezing point					
Value		-84.8			℃
Boiling point					
Value		86.7			℃
Flash point					
Value		℃			
Remarks	Not applicable				
Explosion limits					
Lower explosion limit		8.0	to	44.8	%(V)
Source	Literature value				
Vapour pressure					
Value		9.9			kPa
Temperature		25	℃		
Source	Literature value				
Vapour density					
Value		4.5			
Source	Literature value				
Density					
Value		1.465			g/cm³
Temperature		20	℃		
Solubility in water					
Value		1.1			g/l
Temperature		20	℃		
Source	Literature value				
Octanol/water partition coefficient (log Pow)					
pOW		2.53			
Method	experimental				

Ignition temperature

Value	410	℃
Method	DIN 51794	

Thermal decomposition

Remarks: To avoid thermal decomposition, do not overheat.

Viscosity

dynamic

Value	0.58	mPa.s
Temperature	20 ℃	
Source	Literature value	

kinematic

Value	0.396	mm²/s

Explosive properties

no

Oxidising properties

Remarks: Not applicable

10. Stability and reactivity

10.4. Conditions to avoid

No decomposition if stored and applied as directed. To avoid thermal decomposition, do not overheat. Flames. Heat. Protect from direct sunlight.

Thermal decomposition

Remarks: To avoid thermal decomposition, do not overheat.

10.5. Incompatible materials

oxigen, NO2, Reactions with strong alkalies and oxidising agents. Reactions with alkali metals. Reactions with earth alkali metals. Reactions with light metals. Reactions with metals in powder form. amines

10.6. Hazardous decomposition products

Hydrogen chloride (HCl), Phosgene, Chlorine, Carbon monoxide and carbon dioxide

11. Toxicological information

11.1. Information on toxicological effects

Acute oral toxicity

Species	rat	
LD50	5400	mg/kg
Species	Human	
LDLo	7.000	mg/kg

Acute dermal toxicity

Species	rabbit	
LD50	> 2000	mg/kg
Remarks	Danger of resorption through the skin.	

Acute inhalational toxicity

Species	rat	
LC50	12500	ppm(V)
Duration of exposure	4 h	
Remarks	Irritating to respiratory system.	

Skin corrosion/irritation

Remarks	Irritating to skin.
Remarks	Irritates the mucous membrane.

Serious eye damage/irritation

Remarks	Irritates the eyes.

Sensitization

Species	mouse
Remarks	May cause allergic skin reactions.
Species	guinea pig
Remarks	May cause allergic skin reactions.

Reproduction toxicity

Remarks	No indications of toxic effects were observed in reproduction studies in animals.

Carcinogenicity

Remarks	Suspicion about carcinogenic effect.

Experience in practice

Liver and Kidney damage is possible. In the case of swallowing with subsequent vomiting, aspiration of the lungs can occur which can lead to quick intake and damage of other organ systems. When inhaled in larger quantities, the solvent vapours cause a narcotic effect. Alcohol intake increases the toxic effect.

12. Ecological information

12.1. Toxicity

Fish toxicity

Reference substance	Trichloroethylene			
Species	Limanda limanda			
LC50		16		mg/l
Duration of exposure		96	h	
Reference substance	1,2-Epoxybutane			
Species	golden orfe (Leuciscus idus)			
LC50	>	100		mg/l
Duration of exposure		96	h	

Daphnia toxicity

Reference substance	Trichloroethylene			
Species	Daphnia magna			
EC50		20.8		mg/l
Duration of exposure		48	h	
Reference substance	1,2-Epoxybutane			
Species	Daphnia magna			
EC50		70		mg/l
Duration of exposure		48	h	

Algae toxicity

Reference substance	1,2-Epoxybutane			
Species	Desmodesmus subspicatus			
ErC50	>	500		mg/l
Duration of exposure		72	h	

Bacteria toxicity

Reference substance	Trichloroethylene			
Species	activated sludge			
EC50		260		mg/l
Duration of exposure		3	h	
Method	OECD 209			
Reference substance	1,2-Epoxybutane			

Species	activated sludge		
EC50	900		mg/l
Duration of exposure	0.5	h	
Method	OECD 209		

12.2. Persistence and degradability

Biodegradability

Value	2.4		%
Duration of test	14	d	
Method	OECD 301C		
Remarks	The product is not readily biodegradable according to OECD criteria but is inherently biodegradable.		

12.3. Bioaccumulative potential

Octanol/water partition coefficient (log Pow)

pOW	2.53
Method	experimental

12.6. Other adverse effects

General information / ecology

Do not allow it to reach ground water, water bodies or sewage system. Toxic for aquatic organismes.

13. Disposal considerations

13.1. Waste treatment methods

Disposal recommendations for the product

EWC waste code	No not dispose with rubbish.
EWC waste code	Should not be released into the sanitary sewer system.

Recovery or recycling, if possible. Otherweise: combustion in incineration plant.
Disposal in compliance with local and national regulations.

Disposal recommendations for packaging

Disposal in compliance with local and national regulations.

14. Transport information

Land transport ADR/RID

14.1. UN number
UN 1710
14.2. UN proper shipping name
TRICHLOROETHYLENE
14.3. Transport hazard class(es)

Class	6.1
Label	6.1

14.4. Packing group

Packing group	III

Marine transport IMDG/GGVSee

14.1. UN number
UN 1710
14.2. UN proper shipping name
TRICHLOROETHYLENE
14.3. Transport hazard class(es)

Class	6.1

14.4. Packing group

Packing group	III

14.5. Environmental hazards

no

Air transport ICAO/IATA

14.1. UN number

UN 1710

14.2. UN proper shipping name

TRICHLOROETHYLENE

14.3. Transport hazard class(es)

Class 6.1

14.4. Packing group

Packing group III

15. Regulatory information

15.2. Chemical safety assessment

For this substance a chemical safety assessment has been carried out.

16. Other information

R-phrases listed in Chapter 3

11	Highly flammable.
20/21/22	Harmful by inhalation, in contact with skin and if swallowed.
36/37/38	Irritating to eyes, respiratory system and skin.
36/38	Irritating to eyes and skin.
40	Limited evidence of a carcinogenic effect.
45	May cause cancer.
52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
67	Vapours may cause drowsiness and dizziness.

Hazard statements listed in Chapter 3

H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H351	Suspected of causing cancer.
H412	Harmful to aquatic life with long lasting effects.

Supplemental information

Relevant changes compared with the previous version of the safety data sheet are marked with: ***
This information is based on our present state of knowledge. However, it should not constitute a guarantee for any specific product properties and shall not establish a legally valid relationship.