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

1.1 Product identifier

Trade name ***Trichloroethylene***

Stock number: L14474
CAS Number:
79-01-6
EC number:
201-167-4
Index number:
602-027-00-9

1.2 Relevant identified uses of the substance or mixture and uses advised against.
Identified use:
SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
SU24 Scientific research and development

1.3 Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Thermo Fisher (Kandel) GmbH
Zeppelinstr. 7b
76185 Karlsruhe / Germany
Tel: +49 (0) 721 84007 280
Fax: +49 (0) 721 84007 300
Email: tech@alfa.com
www.alfa.com
Informing department: Product safety Tel + +049 (0) 7275 988687-0
1.4 Emergency telephone number:
Carechem 24: +44 (0) 1235 239 670 (Multi-language emergency number)
Poison Information Center Mainz
www.giftinfo.uni-mainz.de Telephone: +49(0)6131/19240

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008


GHS08 health hazard

Muta. 2	H341	Suspected of causing genetic defects.
Carc. 1B	H350	May cause cancer.


GHS07

Skin Irrit. 2	H315	Causes skin irritation.
Eye Irrit. 2	H319	Causes serious eye irritation.
STOT SE 3	H336	May cause drowsiness or dizziness.
Aquatic Chronic 3	H412	Harmful to aquatic life with long lasting effects.

Other hazards that do not result in classification No information known.

2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008 The substance is classified and labelled according to the CLP regulation.
Hazard pictograms


GHS07 GHS08

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

P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P281	Use personal protective equipment as required.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

3.1 Substances
CAS# Designation:
79-01-6 Trichloroethylene
Identification number(s):
EC number: 201-167-4
Index number: 602-027-00-9

SECTION 4: First aid measures

4.1 Description of first aid measures
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
Seek immediate medical advice.
After skin contact
Instantly wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact Rinse opened eye for several minutes under running water. Then consult doctor.

(Contd. on page 2)

Trade name *Trichloroethylene*

(Contd. of page 1)

After swallowing Seek medical treatment.
4.2 Most important symptoms and effects, both acute and delayed
Causes skin irritation.
Causes serious eye irritation.
May cause respiratory irritation.
May cause cancer.
May cause drowsiness or dizziness.
4.3 Indication of any immediate medical attention and special treatment needed No further relevant information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media
Suitable extinguishing agents Use carbon dioxide, extinguishing powder or foam. Water may be ineffective but may be used for cooling exposed containers.
5.2 Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:
Carbon monoxide and carbon dioxide
Hydrogen chloride (HCl)
5.3 Advice for firefighters
Protective equipment:
Wear self-contained breathing apparatus.
Wear full protective suit.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
6.2 Environmental precautions: Do not allow product to reach sewage system or water bodies.
6.3 Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose of contaminated material as waste according to section 13.
Prevention of secondary hazards: No special measures required.
6.4 Reference to other sections
See Section 7 for information on safe handling
See section 8 for information on personal protection equipment.
See Section 13 for information on disposal.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Keep containers tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation/exhaustion at the workplace.
Open and handle container with care.
Information about protection against explosions and fires: No information known.

7.2 Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and containers: No special requirements.
Information about storage in one common storage facility:
Store away from strong bases.
Store away from oxidising agents.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Store in a locked cabinet or with access restricted to technical experts or their assistants.
7.3 Specific end use(s) No further relevant information available.

SECTION 8: Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

8.1 Control parameters

Components with critical values that require monitoring at the workplace:	
79-01-6 Trichloroethylene (100,0%)	
MAK (Germany)	vgl.Abschn.XIII
PEL (USA)	Long-term value: 100 ppm Ceiling limit: 200; 300* ppm *5-min peak in any 2 hrs
REL (USA)	See Pocket Guide Apps. A and C
TLV (USA)	Short-term value: 135 mg/m³, 25 ppm Long-term value: 54 mg/m³, 10 ppm BEI

Ingredients with biological limit values:
79-01-6 Trichloroethylene (100,0%)

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Trade name *Trichloroethylene*

(Contd. of page 2)

BGW (Germany)	5 mg/l Untersuchungsmaterial: Vollblut Probennahmezeitpunkt: Expositionsende bzw. Schichtende, bei Langzeitexposition: Nach mehreren vorangegangenen Schichten Parameter: Trichlorethanol 100 mg/l Untersuchungsmaterial: Urin Probennahmezeitpunkt: Expositionsende bzw. Schichtende, bei Langzeitexposition: Nach mehreren vorangegangenen Schichten Parameter: Trichloressigsäure
BEI (USA)	15 mg/L Medium: urine Time: end of shift at end of workweek Parameter: Trichloroacetic acid (nonspecific) 0,5 mg/L Medium: blood Time: end of shift at end of workweek Parameter: Trichloroethanol without hydrolysis (nonspecific) - Medium: blood Time: end of shift at end of workweek Parameter: Trichloroethylene (semi-quantitative) - Medium: end-exhaled air Time: end of shift at end of workweek Parameter: Trichloroethylene (semi-quantitative)

Additional information: No data

8.2 Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures should be adhered to in handling the chemicals.
Keep away from foodstuffs, beverages and food.
Instantly remove any soiled and impregnated garments.
Wash hands during breaks and at the end of the work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.
Breathing equipment: Use breathing protection with high concentrations.
Recommended filter device for short term use:
Use a respirator with organic vapor/acid gas cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards such as NIOSH (USA) or CEN (EU).
Protection of hands:
Check protective gloves prior to each use for their proper condition.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
Material of gloves Fluorocarbon rubber (Viton)
Penetration time of glove material (in minutes) 480
Glove thickness 0.7 mm
Eye protection:
Safety glasses
Face protection
Body protection: Protective work clothing.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties
General Information

Appearance:	
Form:	Liquid
Colour:	Colourless
Smell:	Chloroform-like
Odour threshold:	Not determined.
pH-value:	Not determined.
Change in condition	
Melting point/Melting range:	-85 °C
Boiling point/Boiling range:	87 °C
Sublimation temperature / start:	Not determined
Inflammability (solid, gaseous)	Not determined.
Ignition temperature:	410 °C
Decomposition temperature:	Not determined
Self-inflammability:	Not determined.
Danger of explosion:	Not determined.
Critical values for explosion:	
Lower:	8 Vol %
Upper:	12,5 Vol %
Steam pressure at 20 °C:	77 hPa
Density at 20 °C	1,46 g/cm³
Relative density	Not determined.
Vapour density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water at 20 °C:	1 g/l
Partition coefficient (n-octanol/water):	Not determined.
Viscosity:	
dynamic:	Not determined.
kinematic:	Not determined.
9.2 Other information	No further relevant information available.

SECTION 10: Stability and reactivity

10.1 Reactivity No information known.
10.2 Chemical stability Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided: No decomposition if used and stored according to specifications.
10.3 Possibility of hazardous reactions Reacts with strong oxidising agents
10.4 Conditions to avoid No further relevant information available.

(Contd. on page 4)

Trade name *Trichloroethylene*

(Contd. of page 3)

10.5 Incompatible materials:
Bases
Oxidising agents
10.6 Hazardous decomposition products:
Carbon monoxide and carbon dioxide
Hydrogen chloride (HCl)

SECTION 11: Toxicological information

11.1 Information on toxicological effects
Acute toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for this substance.

LD/LC50 values that are relevant for classification:

Oral	LD50	2402 mg/kg (mouse)
Dermal	LD50	>20000 mg/kg (rabbit)
Inhalative	LC50/4H	8450 ppm/4H (mouse)

Skin irritation or corrosion: Causes skin irritation.
Eye irritation or corrosion: Causes serious eye irritation.
Sensitization: No sensitizing effect known.
Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for this substance.
Carcinogenicity:
May cause cancer.
IARC-1: Carcinogenic to humans: sufficient evidence of carcinogenicity.
NTP-R: Reasonably anticipated to be a carcinogen: limited evidence from studies in humans or sufficient evidence from studies in experimental animals.
EPA-CaH: Carcinogenic to humans.
ACGIH A2: Suspected human carcinogen: Agent is carcinogenic in experimental animals at dose levels, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) considered relevant to worker exposure. Available epidemiologic studies are conflicting or insufficient to confirm an increased risk of cancer in exposed humans.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for this substance.
Reproductive toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains reproductive data for this substance.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure:
May cause respiratory irritation.
May cause drowsiness or dizziness.
Aspiration hazard: No effects known.
Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.
Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

SECTION 12: Ecological information

12.1 Toxicity
Aquatic toxicity: No further relevant information available.
12.2 Persistence and degradability No further relevant information available.
12.3 Bioaccumulative potential No further relevant information available.
12.4 Mobility in soil No further relevant information available.
Ecotoxical effects:
Remark: Harmful to aquatic organisms
Additional ecological information:
General notes:
Water danger class 3 (Assessment by list): extremely hazardous for water.
Do not allow product to reach ground water, water bodies or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into soil.
May cause long lasting harmful effects to aquatic life.
Avoid transfer into the environment.
Harmful to aquatic organisms
12.5 Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
12.6 Other adverse effects No further relevant information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Recommendation
Hand over to disposers of hazardous waste.
Must be specially treated under adherence to official regulations.
Consult state, local or national regulations for proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

SECTION 14: Transport information

UN-Number **ADR, IMDG, IATA**	UN1710
14.2 UN proper shipping name **ADR** **IMDG, IATA**	 1710 TRICHLOROETHYLENE TRICHLOROETHYLENE
14.3 Transport hazard class(es)	
ADR	
	
Class **Label**	6.1 (T1) Toxic substances. 6.1
IMDG, IATA	
	
Class **Label**	6.1 Toxic substances. 6.1
Packing group **ADR, IMDG, IATA**	 III
14.5 Environmental hazards:	Not applicable.
14.6 Special precautions for user **Kemler Number:**	Warning: Toxic substances. 60

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Trade name *Trichloroethylene*

(Contd. of page 4)

EMS Number:	F-A,S-A
Segregation groups	Liquid halogenated hydrocarbons
14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
Transport/Additional information:	
ADR	
Excepted quantities (EQ):	E1
Limited quantities (LQ)	5L
Transport category	2
Tunnel restriction code	E
UN "Model Regulation":	UN1710, TRICHLOROETHYLENE, 6.1, III

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Australian Inventory of Chemical Substances Substance is listed.

Standard for the Uniform Scheduling of Medicines and Poisons

79-01-6	Trichloroethylene	S4, S6

National regulations
Information about limitation of use:
Workers should not be exposed to this hazardous material. Exceptions can be made by the authorities in certain exceptional cases.
Employment restrictions concerning young persons must be observed.
For use only by technically qualified individuals.
Classification according to VbF: Not applicable
Technical instructions (air):

Class	Share in %
III	100,0

Water hazard class: Water danger class 3 (Assessment by list): extremely hazardous for water.
Other regulations, limitations and prohibitive regulations
ELINCS (European List of Notified Chemical Substances) Substance is not listed.
Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
This substance is included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH).
The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
Substance is not listed.
Annex XIV of the REACH Regulations (requiring Authorisation for use) Substance is listed.
15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department
Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VbF: Verordnung über brennbare Flüssigkeiten, Österreich (Ordinance on the storage of combustible liquids, Austria)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
vPvB: very Persistent and very Bioaccumulative
ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
NTP: National Toxicology Program (USA)
IARC: International Agency for Research on Cancer
EPA: Environmental Protection Agency (USA)
Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2
Muta. 2: Germ cell mutagenicity, Hazard Category 2
Carc. 1B: Carcinogenicity, Hazard Category 1B
STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3
Aquatic Chronic 3: Hazardous to the aquatic environment - Chronic Hazard, Category 3