1 Identification

Product identifier
Product name: Trichloroethylene

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

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

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

- 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.

Hazards not otherwise classified
No information known.

Label elements

GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

GHS 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.

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.

WHMIS classification
D1B - Toxic material causing immediate and serious toxic effects
D2A - Very toxic material causing other toxic effects

Classification system

HMIS ratings (scale 0-4) (Hazardous Materials Identification System)

- Health (acute effects) = 2
- Flammability = 0
- Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
3 Composition/information on ingredients

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

4 First-aid measures

Description of first aid measures
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately 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 a doctor.
After swallowing
Seek medical treatment.

Information for doctor
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.

Indication of any immediate medical attention and special treatment needed
No further relevant information available.

5 Fire-fighting measures

Extinguishing media
Suitable extinguishing agents Use carbon dioxide, extinguishing powder or foam. Water may be ineffective but may be used for cooling exposed containers.
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)

Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation.

Environmental precautions: Do not allow product to reach sewage system or any water course.
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.

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 disposal information.

7 Handling and storage

Handling
Precautions for safe handling
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Open and handle container with care.

Information about protection against explosions and fires: No information known.

Conditions for safe storage, including any incompatibilities

Storage
Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility:
Store away from strong bases.
Store away from oxidizing agents.

Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Specific end use(s) No further relevant information available.

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.

Control parameters
Components with limit values that require monitoring at the workplace:

PEL (USA) Long-term value: 100 ppm
Ceiling limit value: 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
### 38.0.35

**EL (Canada)**
- Short-term value: 25 ppm
- Long-term value: 10 ppm

**AGGIHT A2, IARC 2A**

**EV (Canada)**
- Short-term value: 25 ppm
- Long-term value: 10 ppm

### Ingredients with biological limit values:

**79-01-6 Trichloroethylene (100.0%)**

<table>
<thead>
<tr>
<th>BET (USA)</th>
<th>15 mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium:</td>
<td>urine</td>
</tr>
<tr>
<td>Time:</td>
<td>end of shift at end of workweek</td>
</tr>
<tr>
<td>Parameter</td>
<td>Trichloroacetic acid (nonspecific)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>0.5 mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium:</td>
</tr>
<tr>
<td>Time:</td>
</tr>
<tr>
<td>Parameter:</td>
</tr>
</tbody>
</table>

| 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**

### Exposure controls

#### Personal protective equipment

#### General protective and hygienic measures

The usual precautionary measures for handling chemicals should be followed. Keep away from foodstuffs, beverages and feed. Remove all soiled and contaminated clothing immediately. Wash hands before breaks and at the end of work. Store protective clothing separately. Avoid contact with the eyes and skin. Maintain an ergonomically appropriate working environment.

### Breathing equipment

Use suitable respirator when high concentrations are present. 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

Impervious gloves

Check protective gloves prior to each use for their proper condition. The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

### Material of gloves

Fluorocarbon rubber (Viton)

### Penetration time of glove material (in minutes)

<table>
<thead>
<tr>
<th>480</th>
</tr>
</thead>
</table>

**Glove thickness: 0.7 mm**

### Body protection

Protective work clothing.

### 9 Physical and chemical properties

#### Information on basic physical and chemical properties

**General Information**

<table>
<thead>
<tr>
<th>Appearance:</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color:</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor:</td>
<td>Chloroform-like</td>
</tr>
<tr>
<td>Odor threshold:</td>
<td>Not determined.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>pH-value:</th>
<th>Not determined</th>
</tr>
</thead>
</table>

**Change in condition**

| Melting point/Melting range: | -85 °C (-121 °F) |
| Boiling point/Boiling range: | 87 °C (189 °F) |
| Sublimation temperature / start: | Not determined |
| Flammability (solid, gaseous): | Not determined |
| Ignition temperature: | 410 °C (770 °F) |
| Decomposition temperature: | Not determined |
| Auto ignition: | Not determined |

**Danger of explosion:**

Not determined.

#### Explosion limits

| Lower: | 8 Vol % |
| Upper: | 12.5 Vol % |

**Vapor pressure at 20 °C (68 °F):** 77 hPa (58 mm Hg)

**Density at 20 °C (68 °F):** 1.46 g/cm³ (12.184 lbs/gal)

**Relative density:** Not determined.

**Vapor density:** Not determined.

**Evaporation rate:** Not determined.

**Solubility in / Miscibility with**

Water at 20 °C (68 °F): 1 g/l

**Partition coefficient (n-octanol/water):** Not determined.

**Viscosity:**

- Dynamic: Not determined.
- Kinematic: Not determined.

**Other information**

No further relevant information available.

### 10 Stability and reactivity

**Reactivity**

No information known.

**Chemical stability**

Stable under recommended storage conditions.
38.0.35
Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions Reacts with strong oxidizing agents
Conditions to avoid No further relevant information available.
Incompatible materials:
Bases
Oxidizing agents
Hazardous decomposition products:
Carbon monoxide and carbon dioxide
Hydrogen chloride (HCl)

11 Toxicological information
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:

<table>
<thead>
<tr>
<th>Route</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>LD50 2402 mg/kg (mouse)</td>
</tr>
<tr>
<td>Dermal</td>
<td>LD50 &gt;20000 mg/kg (rabbit)</td>
</tr>
<tr>
<td>Inhalative</td>
<td>LC50/4H 8450 ppm/4H (mouse)</td>
</tr>
</tbody>
</table>

Skin irritation or corrosion: Causes skin irritation.
Eye irritation or corrosion: Causes serious eye irritation.
Sensitization: No sensitizing effects 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.
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.
Carcinogenic categories:
OSHA-Ca (Occupational Safety & Health Administration) Substance is not listed.

12 Ecological information
Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability No further relevant information available.
Bioaccumulative potential No further relevant information available.
Mobility in soil No further relevant information available.
Ecotoxic effects:
Remark: Harmful to aquatic organisms
Additional ecological information:
General notes:
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
May cause long lasting harmful effects to aquatic life.
Avoid transfer into the environment.
Harmful to aquatic organisms
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects No further relevant information available.

13 Disposal considerations
Waste treatment methods
Recommendation Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information
UN-Number
DOT, IMDG, IATA UN1710

UN proper shipping name
DOT RQ Trichloroethylene
IMDG, IATA TRICHLOROETHYLENE

Transport hazard class(es)
DOT 6.1 Toxic substances.

Class 6.1 (T1) Toxic substances
Safety Data Sheet
acc. to OSHA HCS

Product name: Trichloroethylene

Label
IMDG, IATA

Class
6.1

Label
6.1

Packing group
DOT, IMDG, IATA

III

Environmental hazards:
Not applicable.

Special precautions for user
Warning: Toxic substances

EMS Number:
F-A, S-A

Segregation groups
Liquid halogenated hydrocarbons

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not applicable.

Transport/Additional information:
DOT
100 lbs, 45.4 kg

Marine Pollutant (DOT):
No

UN "Model Regulation":
UN1710, Trichloroethylene, 6.1, III

15 Regulatory information
Safety, health and environmental regulations/legislation specific for the substance or mixture
The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

GHS label elements

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.

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.

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

SARA Section 313 (specific toxic chemical listings)
79-01-6 Trichloroethylene

California Proposition 65
Prop 65 - Chemicals known to cause cancer
79-01-6 Trichloroethylene

Prop 65 - Developmental toxicity
79-01-6 Trichloroethylene

Prop 65 - Developmental toxicity, female
Substance is not listed.

Prop 65 - Developmental toxicity, male
79-01-6 Trichloroethylene

Information about limitation of use:
Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.

For use only by technically qualified individuals.

This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

Other regulations, limitations and prohibitive regulations
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.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

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

Date of preparation / last revision: 03/24/2016

Abbreviations and acronyms:

ACDS: Accords des chaînes de transport des marchandises dangereuses per Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
vPvB: very Persistent and very Bioaccumulative

(Contd. on page 6)
Product name: Trichloroethylene

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
Mut. 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