# Ethyl CHloride

| CAS number: | 75-00-3 |
| --- | --- |
| Synonyms: | Chloroethane, anodynon, chelen, chlorene, chloroethane, chloroethyl, chloryl, dublofix, hydrochloric ether, kelene, monochloroethane, narcotile |
| Chemical formula: | C2H5Cl |

Workplace exposure standard (amended)

| TWA: | **100 ppm (264 mg/m3)** |
| --- | --- |
| STEL: | **—** |
| Peak limitation: | **—** |
| Notations: | **Carc. 2, Sk.** |
| IDLH: | **3,800 ppm** |
| Sampling and analysis: The recommended value is quantifiable through available sampling and analysis techniques. | |

## Recommendation and basis for workplace exposure standard

A TWA of 100 ppm (264 mg/m3) is recommended to protect for adverse effects of the liver, central nervous system (CNS) and heart in exposed workers.

## Discussion and conclusions

Ethyl chloride has been used in the manufacture of tetraethyl lead, ethylcellulose, dyes, drugs and perfumes. It has also been used in industry for chemical processes.

Critical effects of exposure include potential hepatotoxicity, fetotoxicity and CNS effects. Limited data are available in humans. Only two primary sources of information are available, both recommending a TWA of 100 ppm.

In a sub-chronic inhalation study in rats, no effects were identified at 1,600 ppm with liver effects seen at 4,000 ppm. A NOAEC of 1,250 ppm was identified in a mouse study with continuous exposure for 11 days (effects in the heart, CNS and liver were observed at higher doses) (ACGIH, 2018; SCOEL, 1999). The TWA derived by SCOEL (1999) is based on this NOAEC. A NOAEC of 1,504 ppm for delayed foetal ossification was reported in a mouse developmental inhalation study (US EPA, 1991). Cancer has also been reported as a potential effect in animals at very high exposure.

A TWA of 100 ppm is recommended as derived by ACGIH (2018) and SCOEL (1999) based on the NOAEC seen in mice and an uncertainty factor of 10 to account for the short duration of the study. This TWA is cited to be protective of possible liver, heart and CNS effects and fetotoxicity.

## Recommendation for notations

Classified as a category 2 carcinogen according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Not classified as a skin sensitiser or respiratory sensitiser according to the GHS.

A skin notation is recommended based dermal absorption evidence in analogous chemicals including ethyl bromide, methyl bromide and methyl chloride and the potential for contribution to systemic toxicity.

# Appendix

### Primary sources with reports

| Source Year set Standard |
| --- |
| SWA 1991 TWA: 1,000 ppm (2640 mg/m3) | |
|  |
| ACGIH 2001 TLV-TWA: 100 ppm (264 mg/m3) |
| TLV-TWA recommended to minimise the potential for possible liver effects, fetotoxicity and cancer. Effects identified in animal data only.  No derivation provided.  Summary of data:  Human data:   * May cause irritation of the eyes and respiratory tract * Slight effects in volunteers administered 13,000 ppm; no further exposure data * Women occupationally exposed at unknown concentrations of a mix of chemicals including ethyl chloride, ethylenediamine, ammonia, polyethylene polyamines and vinyl chloride suffered genital disorders including vaginitis and inflammatory diseases of the cervix and uterus.   Animal data:   * LC50: 60,632 ppm (rats and mice, 2 h) * No effects identified in dogs <10,000 ppm * In rats, 6 h/d, 5 d/wk for 2 wk or for 1 x 6 h inhalation exposure at 1,600, 4,000 or 10,000 ppm; 4,000 ppm produced liver effects; no effects at 1,600 ppm * Fetotoxicity in mice at 5,000 ppm; no evidence of teratogenicity; no further information * Mice exposed at 15,000 ppm 6 h/d, 5 d/wk for 100 wk produced significant increase in uterine cancers; no further doses * Malignant skin neoplasms in rats exposed at 15,000 ppm 6 h/d, 5 d/wk for 102 wk; no further doses.   Positive mutagenicity in *S. typhimurium*, but negative in DNA damage and repair assays with rat or mouse hepatocytes.  Skin notation based on analogous chemicals such as ethyl bromide, methyl bromide and methyl chloride.  Insufficient data to recommend a sensitiser notation or STEL. |
| DFG NA NA |
| No report. |
| SCOEL 1999 TWA: 100 ppm (268 mg/m3) |
| Summary of additional data:   * NOAEL of 1,250 ppm (3,350 mg/m3) for effects in the heart, CNS and liver in mice; continuous exposure for 11 d * TWA derived from NOAEL with uncertainty factor of 10 for short term animal study. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN NA NA |
| No report. |

### Secondary source reports relied upon

| Source |  | Year | Additional information |
| --- | --- | --- | --- |
| NICNAS |  | 2013 | * Positive for genotoxicity *in vitro* however genotoxicity has not been demonstrated *in vivo* * The data are not sufficient to be regarded as probably carcinogenic to humans. |
| US EPA |  | 1991 | * NOAEL of 1,504 ppm identified in mouse developmental inhalation study; delayed foetal ossification. |

### Carcinogenicity — non-threshold based genotoxic carcinogens

| Is the chemical mutagenic? | Insufficient data |
| --- | --- |
| Is the chemical carcinogenic with a mutagenic mechanism of action? | Insufficient data |
| **Insufficient data are available to determine if the chemical is a non-threshold based genotoxic carcinogen.** |  |

## Notations

| Source | Notations |
| --- | --- |
| SWA | Carc. 2 |
| HCIS | Carcinogenicity – category 2 |
| NICNAS | Carc. Cat 3 |
| EU Annex | NA |
| ECHA | Carc. 2 |
| ACGIH | Carcinogenicity – A3, Skin |
| DFG | NA |
| SCOEL | NA |
| HCOTN | NA |
| IARC | Carcinogenicity – Group 3 |
| US NIOSH | NA |

NA = not applicable (a recommendation has not been made by this Agency); — = the Agency has assessed available data for this chemical but has not recommended any notations

### Skin notation assessment

| Calculation |
| --- |
| Insufficient data to assign a skin notation, however as per the ACGIH (2018) skin notation is recommended based dermal absorption evidence in analogous chemicals such as ethyl bromide, methyl bromide, and methyl chloride. |

### IDLH

| Is there a suitable IDLH value available? | Yes, based on LEL |
| --- | --- |

## Additional information

| Molecular weight: | 64.51 |
| --- | --- |
| Conversion factors at 25°C and 101.3 kPa: | 1 ppm = Number mg/m3; 1 mg/m3 = Number ppm |
| This chemical is used as a pesticide: |  |
| This chemical is a biological product: |  |
| This chemical is a by-product of a process: |  |
| A biological exposure index has been recommended by these agencies: | ACGIH  DFG  SCOEL |

## Workplace exposure standard history

| Year | Standard |
| --- | --- |
| Click here to enter year |  |

## References

American Conference of Industrial Hygienists (ACGIH®) (2018) TLVs® and BEIs® with 7th Edition Documentation, CD-ROM, Single User Version. Copyright 2018. Reprinted with permission. See the [*TLVs® and BEIs® Guidelines section*](http://www.acgih.org/tlv-bei-guidelines/policies-procedures-presentations) on the ACGIH website.

EU Scientific Committee on Occupational Exposure Limits (SCOEL) (1999) Recommendation from the Scientific Committee on Occupational Exposure Limits for chloroethane. SCOEL/SUM/23.

European Chemicals Agency (ECHA) (2019) Ethyl chloride – REACH assessment.

International Agency for Research on Cancer (IARC) (1999) Chloroethane. IARC Monographs on the evaluation of the carcinogenic risk to humans.

National Industrial Chemicals Notification and Assessment Scheme (NICNAS) (2013) Ethane, chloro: Human health tier II assessment – IMAP report.

US Environmental Protection Authority (US EPA) (1991) Integrated Risk Information System (IRIS) Chemical Assessment Summary – Ethyl chloride.

US National Institute for Occupational Safety and Health (NIOSH) (1994) Immediately dangerous to life or health concentrations – Ethyl chloride.