# Cyanogen chloride

| CAS number: | 506-77-4 |
| --- | --- |
| Synonyms: | Chlorcyan, chlorine cyanide, chlorocyanogen |
| Chemical formula: | CNCl |
| Structural formula: | — |

Workplace exposure standard (retained)

| TWA: | — |
| --- | --- |
| STEL: | — |
| Peak limitation: | **0.3 ppm (0.75 mg/m3)** |
| Notations: | — |
| IDLH: | — |
| Sampling and analysis: | The recommended value is quantifiable through available sampling and analysis techniques. |

## Recommendation and basis for workplace exposure standard

A peak limitation of 0.3 ppm (0.75 mg/m3) is recommended to protect for eye, skin and respiratory tract irritation and the possibility of cellular metabolic interference by the cyanide anion.

## Discussion and conclusions

Cyanogen chloride is used in organic synthesis, as a warning agent in fumigant gases and as a poison gas by the military.

There are limited data available. In humans, a LOAEL for acute irritation is reported at 1 ppm (ACGIH, 2018).

Based on the above, the recommended peak limitation is considered sufficiently low to minimise the potential for eye, skin and respiratory tract irritation. The NOAEL for cellular metabolic interference is unknown. However, based on the rate at which cyanogen chloride is metabolised, the peak limitation is adequate to minimise the possibility of cellular metabolic interference by the cyanide anion.

## Recommendation for notations

Not classified as a 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.

There are insufficient data to recommend a skin notation.

# Appendix

### Primary sources with reports

| Source Year set Standard |
| --- |
| SWA 1991 Peak limitation: 0.3 ppm (0.75 mg/m3) | |
|  |
| ACGIH 2014 TLV-Ceiling: 0.3 ppm (0.75 mg/m3) |
| TLV-Ceiling recommended to minimise eye, skin and respiratory tract irritation and the possibility of cellular metabolic interference by the cyanide anion.  Summary of data:  Human data:   * LOAEL: 1 ppm (10 min, inhalation) * Inhalation exposure at 48 ppm (120 mg/m3) fatal within 30 min * Endogenous cyanide in tissues is metabolized approximately 17 µg/kg/min.   Animal data   * Hydrogen cyanide study, cyanogen chloride NOAEL: ≈25.3 mg/kg/d (rat, 2 yr, oral).   Insufficient data to assign a carcinogen, skin or sensitiser notation. |
| DFG 1973 Not assigned |
| Summary of additional information:   * Acute inhalation toxicity study: concentrations range 20–800 ppm (exposure times from  20–60 min), 1 dog survived 20 min at 20 ppm, all other subjects died * LD50: 2.5 mg/kg (rabbits, parenteral intake). |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN 2004 TWA-Ceiling: 0.3 ppm (0.6 mg/m3) |
| Summary of additional information:  The committee considers the toxicological database on cyanogen chloride too poor to justify recommendation of a health-based OEL.   * Concentrations of ≈260 mg/m3 (100 ppm) were reported as lethal to dogs, rats and mice after 20, 37 and 60 min, respectively * LD50: 3.15 and 3.30 mg/kg (rabbits and dogs, intravenous) * LD50: 6 mg/kg (cats, oral). |

### Secondary source reports relied upon

NIL.

### 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 | NA |
| HCIS | NA |
| NICNAS | NA |
| EU Annex | NA |
| ECHA | NA |
| ACGIH | NA |
| DFG | NA |
| SCOEL | NA |
| HCOTN | NA |
| IARC | NA |
| 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 |

### IDLH

| Is there a suitable IDLH value available? | No |
| --- | --- |

## Additional information

| Molecular weight: | 61.5 |
| --- | --- |
| 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.

Deutsche Forschungsgemeinschaft (DFG) (1973) Chlorcyan – MAK value documentation.

Health Council of the Netherlands (HCOTN) (2004) Cyanogen chloride. Health-based Reassessment of Administrative Occupational Exposure Limits. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/116.