# Carbonyl fluoride

| CAS number: | 353-50-4 |
| --- | --- |
| Synonyms: | Carbonyl difluoride, carbon oxyfluoride, fluorophosgene |
| Chemical formula: | COF2 |
| Structural formula: |  |

Workplace exposure standard (retained)

| TWA: | **2 ppm (5.4 mg/m3)** |
| --- | --- |
| STEL: | **5 ppm (13 mg/m3)** |
| Peak limitation: | **—** |
| Notations: | **—** |
| IDLH: | **—** |
| Sampling and analysis: | The recommended value is quantifiable through available sampling and analysis techniques. |

## Recommendation and basis for workplace exposure standard

The TWA of 2 ppm (5.4 mg/m3) and a STEL of 5 ppm (13 mg/m3) are recommended to protect for pulmonary irritant effects and systemic deposition of fluorides in exposed workers.

## Discussion and conclusions

Carbonyl fluoride is used as a chemical intermediate in organic synthesis.

Limited data exists in humans and animals. Carbonyl fluoride is hydrolysed in mucous fluid of respiratory tract to produce carbon dioxide and hydrogen fluoride. In animals, hydrogen fluoride is known to cause increasing fluoride excretion, inhibition of succinic dehydrogenase in the kidney, deaths due to repeated sub-lethal exposures and liver and kidney injury (ACGIH, 2018).

It is recommended that the current SWA and ACGIH (2018) TLV-TWA of 2 ppm and STEL of 5 ppm (based on analogy to fluorides and hydrogen fluorides) are retained. The recommended TWA and STEL are considered to protect for long-term and short-term effects caused by generation of fluorides upon hydrolysis.

## 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 TWA: 2 ppm (5.4 mg/m3); STEL: 5 ppm (13 mg/m3) | |
|  |
| ACGIH 2001 TLV-TWA: 2 ppm (5.4 mg/m3); TLV-STEL: 5 ppm (13 mg/m3) |
| TWA and STEL recommended to minimise the potential for pulmonary irritation and disabling bone changes secondary to excessive systemic deposition of fluorides (by analogy to TLV for fluorides and hydrogen fluorides).  Summary of data:  Human data:   * Limited information available * When inhaled into respiratory tract, carbonyl fluoride is hydrolysed in mucous fluid to produce carbon dioxide and hydrogen fluoride * Fluoride transported predominately in plasma with some in or on red blood cells.   Animal data:   * LC50: 360 ppm for 8 wk old rats; 460 ppm for 24 wk old * Toxic effects resemble effects of hydrogen fluoride (no further information) * Hydrogen fluoride is known to cause increasing fluoride excretion, inhibition of succinic dehydrogenase in the kidney, deaths due to repeated sublethal exposures, and liver and kidney injury in intoxicated animals.   Insufficient data to recommend skin, sensitisation or carcinogenicity notations. |
| DFG NA NA |
| No report. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN NA NA |
| No report. |

### 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 | — |
| 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 information available. |

### IDLH

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

## Additional information

| Molecular weight: | 66.01 |
| --- | --- |
| 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.