# Ethyl butyl ketone

| CAS number: | 106-35-4 |
| --- | --- |
| Synonyms: | Butyl ethyl ketone, EBK, 3-heptanone, heptan-3-one |
| Chemical formula: | C7H14O |
| Structural formula: | — |

Workplace exposure standard (amended)

| TWA: | **50 ppm (234 mg/m3)** |
| --- | --- |
| STEL: | **75 ppm (350 mg/m3)** |
| Peak limitation: | **—** |
| Notations: | **—** |
| IDLH: | **1,000 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 50 ppm (234 mg/m3) is recommended to protect for irritation effects and potential central nervous system (CNS) effects in exposed workers.

A STEL of 75 ppm (350 mg/m3) is recommended to protect for acute eye irritation in exposed workers.

## Discussion and conclusions

Ethyl butyl ketone (EBK) occurs naturally in breads and other baked goods and is used as a fragrance in soaps, perfumes, detergents and creams and lotions. The critical effects include skin and eye irritation and in high concentrations, narcosis.

Limited toxicological data exists in humans and animals. No irritation or sensitisation produced in patch and maximisation tests in humans. No adverse effects reported in rats exposed by inhalation to 700 ppm for 24 weeks. The ACGIH (2018) based its TLV–TWA predominantly by analogy to methyl amyl ketone, methyl isoamyl ketone and methyl isobutyl ketone (MIBK). The TLV-TWA for MIBK is protective for effects to the CNS in addition to irritation. The TLV–STEL for EBK is based on analogy to MIBK. Volunteers reported eye irritation when exposed to concentrations of 200 ppm MIBK and greater for 15 minutes. (ACGIH, 2018).

In the absence of chemical specific data, the current TWA of 50 ppm as adopted from ACGIH (2018) is recommended to be retained. This TWA is expected to be protective of irritant and CNS effects. The STEL of 75 ppm as assigned by ACGIH (2018) is recommended to minimise the effects of acute exposures.

## 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: 50 ppm (234 mg/m3) | |
|  |
| ACGIH 2001 TLV-TWA: 50 ppm (234 mg/m3) TLV-STEL: 75 ppm (350 mg/m3) |
| TLV-TWA recommended to minimise the potential for skin and eye irritation and possible narcosis.  Summary of data:  TLV–TWA is based predominantly by analogy to the TLV-TWAs for methyl amyl ketone, methyl isoamyl ketone and methyl isobutyl ketone. TLV–STEL is based by analogy to methyl isobutyl ketone.  Human data:   * No irritation or sensitisation produced in patch and maximisation tests * Normal component found in human urine in low levels.   Animal data:   * LD50: 2,760 mg/kg (rats, oral) * There were no adverse effects in rats exposed by inhalation to 700 ppm for 72 h/wk for 24 wk (no neurotoxic effects; no changes in clinical chemistry parameters - haemoglobin concentrations, haematocrit, differential counts).   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 | — |
| HCIS | — |
| NICNAS | NA |
| EU Annex | NA |
| ECHA | — |
| 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 data to assign a skin notation |

### IDLH

| Is there a suitable IDLH value available? | Yes |
| --- | --- |

## Additional information

| Molecular weight: | 114.18 |
| --- | --- |
| Conversion factors at 25°C and 101.3 kPa: | 1 ppm = 4.7 mg/m3; 1 mg/m3 = 0.21 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.

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