# Dimethylphthalate

| CAS number: | 131-11-3 |
| --- | --- |
| Synonyms: | 1,2-Benzenedicarboxylic acid dimethyl ester, DMP, Methyl phthalate, Phthalic acid dimethyl ester, Palatinol M, Fermine, Avolin, Mipax |
| Chemical formula: | C10H10O4 |
| Structural formula: | — |

Workplace exposure standard (interim)

| TWA: | **5 mg/m3** |
| --- | --- |
| STEL: | — |
| Peak limitation: | — |
| Notations: | — |
| IDLH: | **2,000 mg/m3** |
| **Sampling and analysis:** The recommended value is quantifiable through available sampling and analysis techniques. | |

## Recommendation and basis for workplace exposure standard

A TWA of 5 mg/m3 is recommended to protect for potential kidney and liver effects and irritation in exposed workers.

A priority evaluation is recommended at the next scheduled review.

## Discussion and conclusions

Dimethylphthalate (DMP) is used in industrial and in consumer products, for example as a fragrance ingredient in cosmetics, domestic and personal care products, as a solvent and plasticiser for cellulose acetate compositions, and in insect repellents, lacquers, paints, plastics and rubbers.

Limited evidence available in humans and animals. DMP exhibits low acute toxicity in animals. A LOAEC of 2,000 mg/m3 (250 ppm) for membrane irritation is reported in cats in an acute inhalation study (ACGIH, 2018). A NOAEL of 800 mg/kg/d is reported in rats for increased liver weight and decreased body weight gain in a reproductive study.

The current TWA of 5 mg/m3 adopted from ACGIH (2018) is recommended to be retained in interim and is cited as protective for potential effects in the kidneys and liver and irritation in exposed workers. Given the lack of evidence, a priority evaluation of the available data is recommended at the next scheduled review.

## 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.

A skin notation is not recommended based on available evidence.

# Appendix

### Primary sources with reports

| Source Year set Standard |
| --- |
| SWA 1991 TWA: 5 mg/m3 | |
|  |
| ACGIH 2006 TLV-TWA: 5 mg/m3 |
| TLV-TWA recommended to prevent upper respiratory irritation and potential systemic liver and kidney effects.  Summary of data:  Available data indicate low toxicity by all routes.  Human data:   * Very few reports of signs or symptoms following exposure despite widespread usage as insect repellent * Contact of liquid with the eye causes intense pain; no damage or mild, reversible disturbance of the corneal epithelium * No occupational epidemiology studies presented.   Animal data:   * LD50: 10 mL/kg * LOAEC: 2,000 mg/m3 (250 ppm); cats acute inhalation; severe mucous membrane irritation * NOAEL: 1.6 g/kg/d; rats, oral; effects in kidneys; no further information provided * NOAEL: 0.8 g/kg/d (800 mg/kg/d); rats, reproductive, oral; maternal toxicity; increased liver weight and decreased bw gain.   TLV-TWA based on 10-fold difference from LOAEC of 250 ppm in cats; low toxicity with effects in kidneys at high doses (NOAEL of 1.6 g/kg/d); lowest NOAEL of 0.8 g/kg/d for maternal toxicity, based on increased liver weight and decreased body weight gain; no derivation of TLV-TWA provided.  Insufficient data to recommend a sensitiser, skin or carcinogenicity notation or STEL. |
| 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

| Source |  | Year | Additional information |
| --- | --- | --- | --- |
| NICNAS |  | 2014 | * LD50:>2,000 mg/kg in rats, rabbits and guinea pigs * Available data do not support a mutagenic, genotoxic or carcinogenic potential * Not expected to have eye or skin irritation, or skin sensitising potential in humans * Toxic effects related to repeated exposure relevant to a human health include those in the liver and reproductive system. |

### Carcinogenicity — non-threshold based genotoxic carcinogens

| Is the chemical mutagenic? | No |
| --- | --- |
| **The chemical is not a non-threshold based genotoxic carcinogen.** |  |

## Notations

| Source | Notations |
| --- | --- |
| SWA | — |
| 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 |
| --- |
| |  |  |  |  | | --- | --- | --- | --- | | Adverse effects in human case study: | no |  |  | | Dermal LD50 ≤1000 mg/kg: | no |  |  | | Dermal repeat-dose NOAEL ≤200 mg/kg: |  |  |  | | Dermal LD50/Inhalation LD50 <10: |  |  |  | | *In vivo* dermal absorption rate >10%: |  |  |  | | Estimated dermal exposure at WES >10%: |  |  |  | |  |  |  | **a skin notation is not warranted** | |

### IDLH

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

## Additional information

| Molecular weight: | 194.18 |
| --- | --- |
| Conversion factors at 25°C and 101.3 kPa: | 1 ppm = 7.93 mg/m3; 1 mg/m3 = 0.126 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.

National Industrial Chemicals Notification and Assessment Scheme (NICNAS) (2014) Dimethylphthalate: PEC report no 37.

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