# 1,3-Dichloro-5,5-dimethyl hydantoin

| CAS number: | 118-52-5 |
| --- | --- |
| Synonyms: | Dactin, DCDMH, halane |
| Chemical formula: | C5H6Cl2N2O2 |
| Structural formula: | — |

Workplace exposure standard (retained)

| TWA: | **0.2 mg/m3** |
| --- | --- |
| STEL: | **0.4 mg/m3** |
| Peak limitation: | — |
| Notations: | **—** |
| IDLH: | **5 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 0.2 mg/m3 is recommended to protect for irritant effects in exposed workers.

## Discussion and conclusions

1,3-Dichloro-5,5-dimethyl hydantoin (DCDMH) is used as a chlorinating agent, as an intermediate for amino acids, drugs and insecticides and as a stabiliser for vinyl chloride polymers.

Limited evidence in humans indicates a single exposure exceeding 0.2 mg/m3 is irritating to the respiratory tract. Limited data from animal studies indicate some skin and eye irritation in rabbits at 600 ppm (HCOTN, 2002).

The current TWA is recommended based on the single exposure evidence presented above. The STEL is recommended to provide further precaution due to the lack of data. This is supported by the ACGIH recommendation (2018) and evidence from the HCOTN (2002) to limit irritation.

## 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: 0.2 mg/m3; STEL: 0.4 mg/m3 | |
|  |
| ACGIH 2001 TLV-TWA: 0.2 mg/m3; TLV-STEL: 0.4 mg/m3 |
| TLV-TWA recommended to minimise potential for respiratory tract irritation reported for a single human exposure case.  TLV-STEL recommended as an additional measure for exposure control.  Summary of data:  Human data:   * Worker experienced cough and chest discomfort from exposure at >0.2 mg/m3.   Animal data:   * LD50: 542±84 mg/kg (rats, oral) * 20 ppm ‘available chlorine’ for 30 d (rats, oral) able to be tolerated.   Insufficient data to recommend skin, Sen or carcinogenicity notations. |
| DFG NA NA |
| No report. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN 2002 TWA: 0.2 mg/m3 |
| Summary of additional data:  Animal data:   * Pure form of chemical severely irritating to skin (rabbits, dermal) * 600 ppm ‘available chlorine’ slightly or mildly irritating when applied to skin and eyes (rabbits) * 5/10 rats died within 2 d following 1 h dust exposure at 20.5 g/m3; necropsy, revealed discoloration of lungs and liver and distention of the stomach with gas * LD50: >20 g/kg (rabbits, dermal) * Generalised tremors, salivation, hyperpnoea, cyclic running and coma at 400–900 mg/kg (rats, effects ≈10 min after dosing, deaths within 18 h) * LD50: 550 mg/kg (rats, oral) * Gavage doses 500 mg/kg on gestational days 6–13 caused mortality in 18% of animals (mice) * Inadequate data from long-term toxicity and carcinogenicity studies * No evidence of mutagenicity or genotoxicity. |

### Secondary source reports relied upon

| Source |  | Year | Additional information |
| --- | --- | --- | --- |
| NICNAS |  | 2019 | * No additional information. |

### Carcinogenicity — non-threshold based genotoxic carcinogens

| Is the chemical mutagenic? | No |
| --- | --- |
| Is the chemical carcinogenic with a mutagenic mechanism of action? | No |
| **The chemical is not a non-threshold based genotoxic carcinogen.** |  |

## Notations

| Source | Notations |
| --- | --- |
| SWA | — |
| HCIS | — |
| NICNAS | NA |
| EU Annex | NA |
| ECHA | NA |
| ACGIH | — |
| DFG | NA |
| SCOEL | NA |
| HCOTN | — |
| IARC | NA |
| US NIOSH | — |

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: | 197.02 |
| --- | --- |
| 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.

Health Council of the Netherlands (HCOTN) (2002) 1,3-Dichloro-5,5-dimethyl hydantoin. Health-based calculated occupational cancer risk values. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/046.

National Industrial Chemicals Notification and Assessment Scheme (NICNAS) (ND) 2,4‑Imidazolidinedione, 1,3-dichloro-5,5-dimethyl-: Chemical Inventory.

US National Institute for Occupational Safety and Health (NIOSH) (1994) Immediately dangerous to life or health concentrations –.1,3-Dichloro-5,5-dimethyl hydantoin.