

# INDENE

**CAS number:** 95-13-6

**Synonyms:** 1H-indene, inden, indonaphthene

**Chemical formula:** C<sub>9</sub>H<sub>8</sub>

**Structural formula:** —

## Workplace exposure standard (interim)

**TWA:** 10 ppm (48 mg/m<sup>3</sup>)

**STEL:** —

**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

A TWA of 10 ppm (48 mg/m<sup>3</sup>) is recommended to protect for the risk of respiratory irritation, liver narcosis, kidney and spleen injuries in exposed workers.

Given the limited data available from the primary sources, it is recommended that a review of additional sources be conducted at the next scheduled review.

## Discussion and conclusions

Indene is used in the preparation of resins, paint, in tile manufacture and as a chemical synthesis intermediate. Indene is also found in petrochemical process streams and in mixed hydrocarbon exposures. Critical effects of acute exposure in animals include respiratory irritation and hepatic, splenic and renal injury (ACGIH 2019).

The available toxicological dataset is limited to acute inhalation studies. A NOAEC of 400 ppm was reported in rats based on a single 40 hour exposure. Mice exposed at 400 ppm for 12 hours demonstrated liver damage and fatalities (ACGIH, 2018). Rats exposed at 0.6 ppm (3 mg/m<sup>3</sup>) continuously for 105 days demonstrated symptoms of elevated cholinesterase activity and catalase inhibition. No evidence of toxicity observed at 0.6 mg/m<sup>3</sup>. This study was not considered adequate to set occupational exposure limit due to lack of controls and the continuous exposure (ACGIH, 2018).

Based on the limited available information and in the absence of reliable chronic exposure data, the current TWA of 10 ppm (48 mg/m<sup>3</sup>) is recommended to be retained in the interim. A detailed examination of the available dataset should be prioritised during 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.

There are insufficient data to recommend a skin notation.

DRAFT

## APPENDIX

### Primary sources with reports

Source	Year set	Standard
<b>SWA</b>	<b>1991</b>	<b>TWA: 10 ppm (48 mg/m<sup>3</sup>)</b>
<b>ACGIH</b>	<b>2008</b>	<b>TLV-TWA: 5 ppm (24 mg/m<sup>3</sup>)</b>
<p>TLV-TWA recommended to minimise the risk of liver narcosis, kidney and spleen injuries in exposed workers.</p> <p>Summary of data:</p> <p>Human data:</p> <ul style="list-style-type: none"> <li>Trace amounts recorded in the breath of unexposed adults suggesting may be metabolically produced by the human body.</li> </ul> <p>Animal data:</p> <ul style="list-style-type: none"> <li>Inhalation exposure at 800–900 ppm (rats, n=40), 12 h to 45 h (comprised of 6 x 7.5 h); effects included hepatic, splenic and renal injury</li> <li>NOAEC of 400 ppm in 10 rats exposed at 400 ppm for 40 h in a different study; no further information; a similar study on mice exposed to 400 ppm for 12 h resulted in liver damage and fatalities</li> <li>Exposure to 630–1,100 ppm (rats, 4 h, aerosol/vapour) symptoms including dyspnoea, wheezing, rhinorrhoea and lacrimation</li> <li>Ciliotoxicity was confirmed through study of effect on chicken embryo cilia</li> <li>No skin irritation effect on rats and guinea pigs after 8 and 3 dermal applications respectively</li> <li>Exposure to 0.6 ppm (3 mg/m<sup>3</sup>) released from plastic floor tiles (rats, continuous, 105 d); symptoms including elevated cholinesterase activity and catalase inhibition. Study was considered inadequate due to continuous exposure, lack of control group and quantitative data</li> <li>Negative in mutagenicity assays.</li> </ul> <p>Insufficient data to recommend a skin, sensitiser or carcinogen notation.</p>		
<b>DFG</b>	<b>NA</b>	<b>NA</b>
No report.		
<b>SCOEL</b>	<b>NA</b>	<b>NA</b>
No report.		
<b>OARS/AIHA</b>	<b>NA</b>	<b>NA</b>
No report.		



Source	Year set	Standard
<b>HCOTN</b>	<b>2002</b>	<b>TWA: 10 ppm (45 mg/m<sup>3</sup>)</b>
<p>The TWA is an administrative OEL.</p> <p>The committee concludes that there is insufficient information to recommend a health-based OEL. No change in the existing value is recommended.</p> <p>Animal data:</p> <ul style="list-style-type: none"><li>• LC<sub>50</sub>: &gt;1,050 ppm (rats, 4 h)</li><li>• LD<sub>50</sub>: 483 ppm (rats, oral).</li></ul>		

### Secondary source reports relied upon

Source	Year	Additional information
ECHA	✓ 2019	<ul style="list-style-type: none"><li>• Test according to OECD guideline 492 and GLP principles, found to be potentially irritant or corrosive</li><li>• No evidence of skin sensitisation in sensitisation assay.</li></ul>

### 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	—
ACGIH	—
DFG	NA
SCOEL	NA
HCOTN	—
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:	116.16
Conversion factors at 25°C and 101.3 kPa:	1 ppm = 4.74 mg/m <sup>3</sup> ; 1 mg/m <sup>3</sup> = 0.211 ppm
This chemical is used as a pesticide:	<input type="checkbox"/>
This chemical is a biological product:	<input type="checkbox"/>
This chemical is a by-product of a process:	<input type="checkbox"/>
A biological exposure index has been recommended by these agencies:	<input type="checkbox"/> ACGIH <input type="checkbox"/> DFG <input type="checkbox"/> SCOEL

## Workplace exposure standard history

Year	Standard
Click here to enter year	

## References

American Conference of Industrial Hygienists (ACGIH®) (2018) TLVs® and BEIs® with 7<sup>th</sup> Edition Documentation, CD-ROM, Single User Version. Copyright 2018. Reprinted with permission. See the [TLVs® and BEIs® Guidelines section](#) on the ACGIH website.

Health Council of the Netherlands (HCOTN) (2002) Indene. Health-based calculated occupational cancer risk values. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/035.

European Chemicals Agency (ECHA) (2019) Indene – REACH assessment.