# Natural Rubber Latex

| CAS number: | 900-04-6 |
| --- | --- |
| Synonyms: | Caoutchouc, india rubber,natural latex, natural rubber, NRL, polyisoprene, rubber |
| Chemical formula: | [C5H8]n |
| Structural formula: | — |

Workplace exposure standard (interim)

| TWA: | **0.1 µg/m3** |
| --- | --- |
| STEL: | **—** |
| Peak limitation: | **—** |
| Notations: | **Sk.** |
| IDLH: | **—** |
| **Sampling and analysis:** There is uncertainty regarding quantification of the recommended value with available sampling and/or analysis techniques. | |

## Recommendation and basis for workplace exposure standard

A TWA of 0.1 µg/m3is recommended to protect for respiratory sensitisation 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

Natural rubber latex is a starting material for the rubber industry.

The critical effect of exposure is respiratory sensitisation.

Evidence in human observational studies and animal experiments consistently demonstrate an excess risk of sensitisation or allergic reactions following repeated exposure. Following sensitisation, inhalation or dermal challenges can produce respiratory and dermal reactions. A cross-sectional epidemiologic study in more than 800 workers reported a NOAEC of 0.001 mg/m3 for weals of 3 mm or greater in diameter. ACGIH (2018) use this study as the basis for its TWA of 0.0001 mg/m3.

A TWA of 0.1 µg/m3is recommended as assigned by ACGIH (2018). This TWA is expected to protect for the potential for sensitisation in exposed workers. A priority evaluation of the available data is recommended at the next 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. Evidence suggests natural rubber latex is both a skin sensitiser and respiratory sensitiser and review of the classification is recommended.

Skin notation recommended based on evidence of systemic allergic reactions produced by a skin exposure in humans.

# Appendix

### Primary sources with reports

| Source Year set Standard |
| --- |
| SWA NA NA | |
| No report. |
| ACGIH 2014 TLV-TWA: 0.0001 mg/m3 (as inhalable allergenic proteins) |
| TLV-TWA recommended to minimise excess risk of respiratory sensitisation or allergic reaction.  Summary of data:  TLV-TWA based on NOAEC of 0.001 mg/m3; no derivation provided.  Human data:   * Cross-sectional epidemiologic study: * Skin exposure shown to be more important than respiratory exposure in predicting latex sensitisation in 500 latex-glove factory workers, 314 workers from rubber plantation and 144 controls * skin prick testing (SPT) showed: * positive correlation between length of employment and response to SPT, and * NOAEL of 0.001 mg/m3 for weals ≥3 mm in diameter; basis for TLV-TWA * Evidence of systemic allergic reactions produced by a skin exposure * Health care workers exposed to relatively lower airborne concentrations had higher prevalence of latex allergy than workers in the glove-manufacturing industry. From this it was concluded that: * dermal exposure is important * once sensitised, workers exhibited allergic reactions at very low levels of airborne natural rubber latex particles.   Animal data:   * Demonstrated dermal and respiratory sensitisation evidenced by immune responses in multiple studies in animal species * Following sensitisation, inhalation or dermal challenges have produced respiratory and dermal reactions. |
| DFG 2001 Not assigned |
| Summary of additional data:   * Contact urticaria but also rhino-conjunctivitis, asthma, urticaria and anaphylactic shock have been described as symptoms of immediate type allergy to products made of natural rubber latex. |
| 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? | No |
| --- | --- |
| **The chemical is not a non-threshold based genotoxic carcinogen.** |  |

## Notations

| Source | Notations |
| --- | --- |
| SWA | NA |
| HCIS | NA |
| NICNAS | NA |
| EU Annex | NA |
| ECHA | NA |
| ACGIH | DSEN, RSEN, Skin |
| DFG | Sh (dermal sensitiser), Sa (respiratory sensitiser) |
| 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: | yes | 4.00 |  | | Dermal LD50 ≤1000 mg/kg: |  |  |  | | 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 warranted** | |

### IDLH

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

## Additional information

| Molecular weight: | Insert molecular weight |
| --- | --- |
| 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.

Deutsche Forschungsgemeinschaft (DFG) (2001) Natural rubber latex – MAK value documentation.