

ToxTree: Formaldehyde Levels ($\mu\text{g}/\text{m}^3$) in Indoor Air and Associated Health Effects

Health Effects Observed in Toxicological Studies

2,300 - Highest level for nasal and eye irritation, neurological effects, increased risk of asthma/ allergies in humans (ATSDR 2010)

490 - ATSDR acute LOAEL - based on respiratory effects in humans (ATSDR 1999)

290 - ATSDR chronic LOAEL - based on respiratory effects in humans (ATSDR 1999)

120 - Lowest level for nasal and eye irritation, neurological effects, and increased risk of asthma/allergies in humans (ATSDR 2010)

49 - ATSDR acute MRL - based on respiratory effects in humans (ATSDR 1999)

33 - LOAEL for USEPA RfC - based on changes in lung function, allergies, and asthma (USEPA 2024a)

9.8 - ATSDR chronic MRL - based respiratory (nasal) effects in occupational study (ATSDR 1999)

7 - USEPA RfC - changes in lung function, allergies, and asthma (USEPA 2024a)

Formaldehyde Levels Measured in Indoor Air

2,300 - Short-term exposures (approx. 25 min.) to indoor air levels of formaldehyde during hair smoothing process / professional blow drying have been reported to be as high as 2,300 (Oregon OSHA 2010)



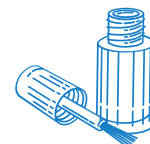
410 - The average indoor air level of formaldehyde over 8-hours in a hair salon during a hair smoothing process that has been reported (Oregon OSHA 2010)

370 or higher - Levels detected in homes with new manufactured wood products were reported (USEPA 2024b)

370 - The median level over eight hours among workers in various industries (such as foundry, resin, chemical industry, textile, embalmers, undertakers) was reported (USEPA 2024a)

There is a wide range in the odor threshold (50-1,200); although most people can smell formaldehyde at or below 100 (WHO 2010)

40 - Highest level detected in U.S. nail salons reported in studies (Zhong et al., 2018; NYDOH 2016)



12-39 - Range of indoor average formaldehyde concentration reported since 2000 in U.S. and Canadian conventional homes. The median formaldehyde concentration is approximately 20 (USEPA 2024a)



DEFINITIONS:

$\mu\text{g}/\text{m}^3$: Micrograms per cubic meter

ATSDR: Agency for Toxic Substances and Disease Registry

USEPA: United States Environmental Protection Agency

MRL: ATSDR minimal risk level at or below which harmful non-cancer health effects are not expected

Chronic: Exposures lasting greater than 365 days

RfC: USEPA reference concentration which is an estimate of a continuous inhalation exposure to the human population that is not likely to result in harmful non-cancer health effects

LOAEL: Lowest observed adverse effect level; TWA = time weighed average

SOURCES: linktr.ee/ToxTreeSources