



How Long Does Second-Hand Smoke Last?

The short answer is days, weeks, months, or even years. The long answer is more complicated.

Second-hand smoke is a dynamic and heterogeneous mixture composed of 4,000 different compounds, all with their own physical and chemical properties. These compounds can be roughly divided into three categories: particulate matter, volatile organic gases, and inorganic compounds (like heavy metals).

After smoking has taken place, the heavier particles fall out of the air and land on surfaces, volatile organic gases react with sunlight and other compounds in the air to form new chemicals, and other compounds either adsorb (stick to surfaces) or absorb into surfaces. In a reverse process later on, these chemicals will then "off-gas" back into the indoor environment. Another term for this residual contamination is "third-hand smoke." Some of the chemical compounds in second-hand smoke are odourless but can be detected in the environment using sensitive equipment long after it can be seen or smelled.

How long second-hand smoke persists in an indoor environment depends on:

- Number of cigarettes smoked;
- Volume of air (depends on layout of the home);
- Ventilation rate;
- Rate of emission of chemical constituents from sidestream and mainstream smoke;
- Furnishing level (material type and surface area);
- Sorbency (how likely something will be absorbed or adsorbed) of surfaces; and
- Rate of de-sorption and re-emission (off-gassing).

Studies have demonstrated that short-term adsorption and absorption reduced potential exposure to certain second-hand smoke chemicals while smoking was taking place, whereas later off-gassing increased concentrations hours after smoking ended. Other studies have shown this to be true regardless of ventilation rates.

For more info visit www.smokefreehousingbc.ca