

## Formaldehyd indoor application

Formaldehyde is a colourless gas at room temperature and has a very pungent odour. Formaldehyde is classed as a volatile organic compound (VOC) and is used as a coating, resin and/or adhesive in many building materials.

The main indoor sources of formaldehyde are composite wood products, such as medium density fibreboard (MDF) and particle board. MDF is a common material used in the manufacture of furniture, cabinets and shelving, and it can contain between 2 and 4 times the amount of urea-formaldehyde that standard particle board does. Formaldehyde is also used in the manufacture of some carpet backings and urea-formaldehyde foam insulation – UFFI

### Health effects

Formaldehyde can cause many different symptoms when present in high concentrations, the first ones are likely to be eye, nose and throat irritation, followed by coughing and breathing difficulties. Asthma attacks, nausea, vomiting, headaches and nose bleeds can also occur. If the exposure to formaldehyde is relatively short term then the health problems usually disappear once the pollutant is removed, however long term exposure increases a persons sensitivity to the gas and may possibly lead to cancer (the greatest risk is to those people who have worked or lived around formaldehyde for over ten years).

### Sampler

The sampler consists of glass-fiber filter treated with sodium bisulfite, housed in a glass vial that is capped when not in use. HCHO diffuses through the tube at a rate dependent on Fick's Law of diffusion. The treated filter at the bottom end of the tube maintains a near-zero HCHO concentration at the base; therefore, the quantity of HCHO transferred through the diffusion path is related to the ambient concentration and the length of time exposed. Collected HCHO is quantified in the laboratory using the chromotropic acid procedures. Sampling periods range usually from one to two weeks.



Diffusion tubes for Formaldehyde indoor application

### Exposure Guidelines

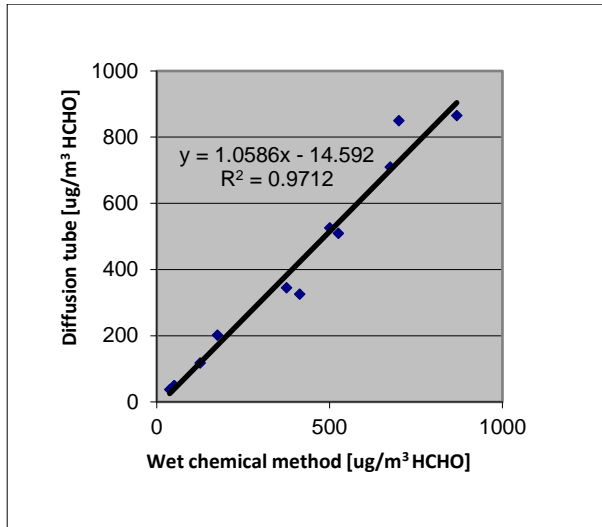
Substances which are classed as human or potential human carcinogens are classified differently to other pollutants, since continuing efforts should be made to reduce exposure to the lowest possible level. Health Canada exposure guidelines therefore list concentrations at an Action Level and a Target Level, where the action level is the exposure level that should be attained immediately, and the target level is the exposure level which should be worked towards as a long-term objective.

Action Level : 0.10 parts per million (ppm) or 120 micro-grams per cubic metre.

Target Level : 0.05 parts per million (ppm) or 60 micro-grams per cubic metre.

The sampler can be used also for ambient monitoring e.g. a follow the effect of clean up procedures in a chipboard factory on the neighbouring areas

## Specifications



The diagram shows the comparison of diffusion tubes with the wet chemical MBTH method in a test chamber

Sampling rate	5.5 ml per minute at 20°C	
Working range	1 – 1000 µg/m³	
Exposure time	1 to 2 weeks	
Detection limit	for a 1-week exposure	2 µg/m³
	for a 2-week exposure	1 µg/m³
External influences:	wind speed	< 10%      0.05 – 0.5 m/s
	temperature	Indoor not relevant      15 to 25°C
	humidity	< 10%      20 to 80%
Storage	before use:	6 months
	after use:	3 months
Interferences	none	
Extended uncertainty*	22.0 %	at a level of 200 µg/m³

\*according to GUM; subject to change without notice

revised: 20.02.2023

## References

- [1] Geisling, K.L. Tashima, M.K.; Girman, J.R. and Miksch, R.R.: Environ. Int. 8 153 – 158 (1982)
- [2] National Institute for Occupational Safety and Health: Formaldehyde in Air –P&CAM 125. in NIOSH Analytical Methods Vol 1.
- [3] Lodge, J.P.: Methods of Air Sampling and Analysis. Intersociety Committee (3<sup>rd</sup> ed.1989) Lewis Publishers ISBN 0-87371-141-6

**passam ag**