

Volatile Organic Compounds

(Formaldehyde, Toluene, D-Limonene)

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Volatile Organic Compounds (VOCs) are a class of substances that are likely to be gases at room temperatures. Many VOCs are present in the indoor and outdoor environments. Common sources range from industrial processes involving petrochemicals, to combustion of fuel, to the natural biological emissions of growing plants. Many VOCs are toxic to humans and can cause a host

of health problems up to and including premature death.

Traditional carbon air purifiers can only concentrate VOCs within their media, they cannot destroy or render them harmless. Studies have shown that carbon filters reach a saturation point and tend to re-release VOCs into the environment.



Molekule's PECO Technology Successfully Removed VOCs From the Air in a Rigorous, Scientifically- Controlled Testing Environment

PURPOSE

This research tested the effectiveness of the PECO technology of Molekule's Home One (MH1) device in destroying VOCs including formaldehyde, toluene, and D-Limonene.

SET-UP

The MH1 was sealed in an eight square meter testing chamber. The VOC mixture was injected into the space and allowed to circulate for two hours after which the first sample was taken. The MH1 was then turned on and allowed to run in the contaminated chamber. Concentrations of VOCs were sampled regularly then quantified with gas chromatography/mass spectrometry and high performance liquid chromatography. This sealed chamber test with a relatively low concentration of a mixture of VOCs is more indicative of a real-world environment than the single-substances tests performed so far.

RESULT

The PECO-Filter inside the MH1 was able to reduce the concentrations of all VOCs below quantification levels within a few hours. These results show that PECO technology is able to destroy VOCs without re-release, unlike any other technology available.

CHALLENGE SUBSTANCE	INITIAL CONCENTRATION	TIME TO POINT OF NON-QUANTIFICATION
Formaldehyde	167 µg/m ³	4 hours
Toluene	730 µg/m ³	1 hour
D-limonene	414 µg/m ³	45 minutes



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Intertek Report on Molekule's Efficacy Against Volatile Organic Compounds

