

Industrial Hygiene Report

Control of Organic Hydrocarbon Vapors: Total Hydrocarbons in a Fuel Mixture

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OBJECTIVE:

The objective of this test was to determine the filtering efficiency of a Sentry Air Systems carbon filter cartridge on total hydrocarbons and octane in two separate fuel mixtures. The experiment was setup to take readings of the total hydrocarbons before and after the carbon filter. This test was conducted with air sampling pumps and sorbent tubes that absorbed the fumes, taking measurements at 2 different points: concentration inside the hood before filtration and concentration after filtration by the outlet of the hood.

PROTOCOL:

- 1) Sentry Air Systems Model SS-330-DCH was set up with a 10 lb Carbon filter. The 300 series unit with carbon filter generates sufficient air volume to keep the air velocity at the hood inlet greater than 100 FPM.
- 2) The experiment used 175 ml of fuel mixture. The experiment was repeated for each fuel mixture. The fuel mixture was measured into a metal pan and placed under the hood. The sampling pumps were turned on and the fuel mixture was allowed to evaporate for 25 minutes while the sampling pumps ran. The two sampling pumps were placed under the hood, directly over the mixture and directly over the fan effluent, respectively.
- 3) After the 25 minute time period, the room was aired out completely before starting the experiment with the other fuel sample.
- 4) Once testing was completed, samples were labeled and sent to an independent laboratory (HIH Laboratory) for results.
- 5) Results were analyzed to determine filter efficiency.

RESULTS:

The results from the independent lab indicate the carbon filter is at least 84% efficient on total hydrocarbons in this fuel mixture. The filter is most likely much more efficient but the outlet side reached its lower limit of detection and so it is impossible to say with confidence what the exact level of efficiency was achieved. Additionally, it was inconclusive on octane because of the fact that there was no measurable amount detected for comparison. However, for the conditions present on that day, the Sentry Air Systems ductless hood is capable of creating a NIOSH compliant working environment for the operator and eliminating at 84% of the hydrocarbons from the airstream.

Experiment with the use of the Sentry Hood:

Chemical being tested	Sample Description	Sampling Time	Concentration (mg)	Concentration (ppm)
n-Octane	Inlet of fan (inside hood)	25 min	< 0.003	< 0.2
n-Octane	Outlet of fan	25 min	< 0.003	< 0.2
Hydrocarbons, total	Inlet of fan (inside hood)	25 min	0.13	5.3
Hydrocarbons, total	Outlet of fan	25 min	< 0.02	< 0.9

For additional information, please contact Sentry Air Systems, Inc.

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