

IH62400 ATTACHMENT 9.8
LOCAL EXHAUST VENTILATION
PERFORMANCE TESTING

System Identification

LEV1	BUILDING Sly Europe, Leicester, UK	ROOM/AREA Laboratory
SYSTEM DESCRIPTION Ravair Desk Top Nail Bar Monomer/Acrylic Extraction System		
SYSTEM TYPE Stand Alone Unit	MANUFACTURER DHA Labs	
Series NBO	MODEL J011/12 ≤10-15m3	SERIAL Test Unit
BLDG MANAGER J Gardner	ESH Coordinator M Griffiths	OTHER CONTACT K Coulthurst

EVALUATOR(S) NAME L Ridge	SIGNATURE <i>Linus Ridge</i>	TEST DATE 19.02.2018
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System Description

The unit is a stand-alone, desktop, air extraction and filtration system. The principal of operation is to remove airborne pollutants from the areas of the operations in Nail Bars and Beauty Therapy Salons – improving the health and safety for both operators and clients coterminously.

Type of Inspection

Performance testing of VOC removal efficiency.

Regulations Applicable

Regulation 8 & 12(3) of COSHH 2004, Confined Spaces Regulations (OC 288/7, The Confined Spaces Regulations 1997).

Identification of LEV Plant and Process

Location of Processes

Nail Bar Laboratory Simulation

Hazardous substance(s) being extracted

Monomer (Methyl/Ethyl Methacrylate C₅H₈O₂ / C₆H₁₀O₂).

Assessment of Safety Level of Simulation

Equipment Suitable for Relevant Testing of Flammable Hydrocarbons, at test dilutions and product concentrations regarding ATEX II GD directive.

LEV Test description performed in accordance with Regulation 8 & 12(3) of COSHH 2004.

The unit was set up and tested using a calibrated vane anemometer, to maximum fan speed achieving 12NM³/Hr (0.2M³/S) volumetric flowrate, with the factory supplied and filled activated charcoal absorption media in situ.

A rig was built attaching a snorkel of 75mm diameter to both the inlet and outlet, using temporary transformers to achieve an airtight seal around the apertures.

The inlet aperture snorkel was modified to enable a venturi “suction lift principal” to increase the concentration levels of Monomer and Ammonia above the normal levels achieved by vapour pressure point and evaporation in a normal working environment.

The exhaust snorkel outlet end was attached to a standard vacuum lab bag and container with air valve shut-off, allowing the entire exhaust of the unit after carbon absorption to be captured in a 0.5M³ sample bag for Monomer pass-through testing and analysis

The test for Monomer was run for 15 minutes.

After the testing the Monomer bottle was re-weighed and had lost 3.2gms in mass.

The carbon fill was re-weighed post testing and recorded an increase in mass of 5.2gms for Monomer.

The bag was then taken to sampling area, for composition analysis, along with a control bag which had been subject to the same test, but with no Monomer introduced into the inlet snorkel.

LEV Test analysis performed in accordance with Regulation 8 & 12(3) of COSHH 2004.

The bag was gravity compression purged over a period of 15 minutes through a dedicated Draeger Type collar, valve and absorption Tube, graduated in PPM (Parts per Million) to test for concentration and efficiency of removal, for Monomer, and furthermore - in the case of control bag, for leaching from the activated carbon packs after the test.

LEV Test results performed in accordance with Regulation 8 & 12(3) of COSHH 2004.

Draeger Tube readings for Monomer in all sample bags was not detected, or was above a measurable limit by the apparatus for all samples from the exhaust of the unit.

Conclusion from laboratory testing and evaluation

The unit removes at least 99.999% of Monomer (Methyl/Ethyl Methacrylate $C_5H_8O_2$ / $C_6H_{10}O_2$ at higher than normal operational loadings.

The unit may also be removing other organic and inorganic odours present in the atmosphere of the Laboratory to below detectable levels, using this apparatus

The unit provides a consistent volumetric flowrate of 0.2NM³/S, providing a suitable extraction velocity for the operator of 0.5M/S in line with COSHH regulation outlined above.

The graph below shows the effect of flowrate upon pressure drop during the sampling runs. There was no significant value for Emissions to be recorded during all three tests. Extraction was constant throughout all three test states, and represents suitably sized fan unit, filtration media and carbon, as shown by the non-inverse increase in carbon media pressure drop when the fan is at full duty.



