



Acron International Technology Limited

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HKUST Entrepreneur

Air Cleaner Test Report

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Acron International Technology Limited

IAQ Contractor, IAQ Control Facilities Supplier, IAQ Consultant

Subsidiary company of the Hong Kong University of Science and Technology

Under the Entrepreneurship Program

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1. Sample Description

Product	: Air Cleaner
Brand Name	: Westinghouse
Model No.	: NCCO1701
No. of Sample Received	: 1
Test Date	: 26 May 2020 – 26 May 2020
Test Item(s)	: Pollutants Removal Efficiency
Test Requested	: Toluene
Test Reference(s)	: In-house method SOP200 (for VOC removal rate)
Test Equipment	: Honeywell instrument ppbRAE 3000
Equipment no.	: E002 – 001
Test Result	: See the attached sheets
Remark	: N/A

2. Detail Description of the sample



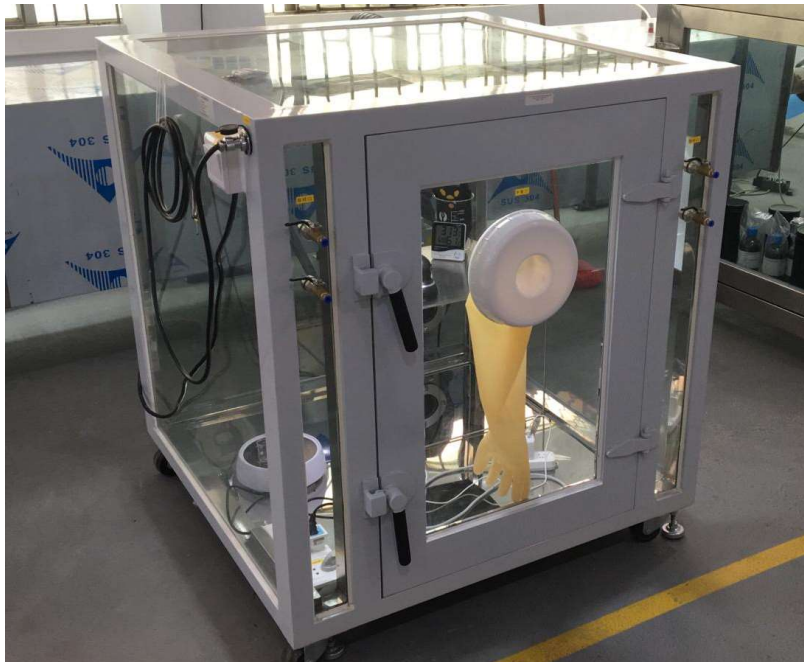
Westinghouse/ NCCO1701



NCCO Reactor NA213020300 and Activated Carbon HEPA

3. Testing Environment

Temperature	: 25.2°C
Relative Humidity	: 60%
Testing Chamber	: 1m ³ Testing Chamber
Size (W × H × D) mm	: 1000 × 1000 × 1000



1m³ Testing Chamber

4. Testing Method of Removal Efficiency

In a 1m^3 chamber, chemical was injected into the chamber by a syringe and evaporated by a hot plate. Internal circulation was turned on throughout the test to ensure the uniformity of chemical concentration inside the chamber. Initial concentration (C_0) of the chemical was recorded before switching on the air cleaner with a range of $100 (\pm 10) \text{ mg/m}^3$. Then, the air cleaner is switched on for 60 minutes and the chemical concentration was recorded as C_{60} , the final concentration of chemical.

The test was repeated without the air cleaner to determine the natural decay of the chemical at the test chamber. Chemical was injected into the chamber by a syringe and evaporated by a hot plate with an initial concentration (C_{N0}). The final concentration (C_{N60}) was determined 60 minutes later

New filters and HEPA have been used for each chemical test.

5. Results of Removal Efficiency

Brand/ Model No.	Operation Mode	Test Chemical	Volume of use (mL)
Westinghouse/ NCCO1701	SS	Toluene	0.34

Initial Concentration (mg/m ³)	Natural Decay, k_n (min ⁻¹)	Total Decay, k_e (min ⁻¹)	Removal Efficiency (%)
95.65	0.003	0.083	99.4

Remark: Initial concentration is set within $100 \pm 10 \text{ mg/m}^3$.

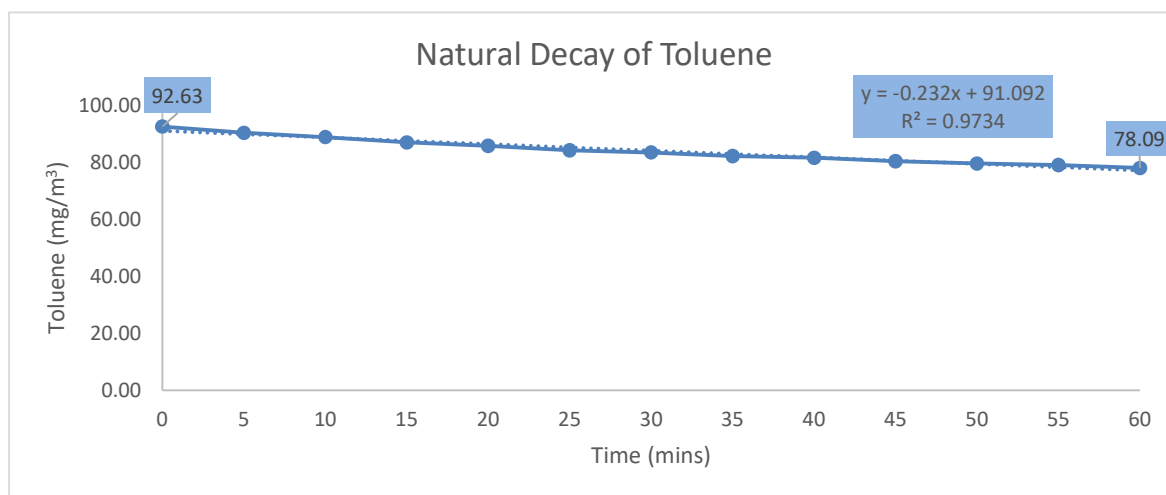


Figure a. Natural Decay of Toluene

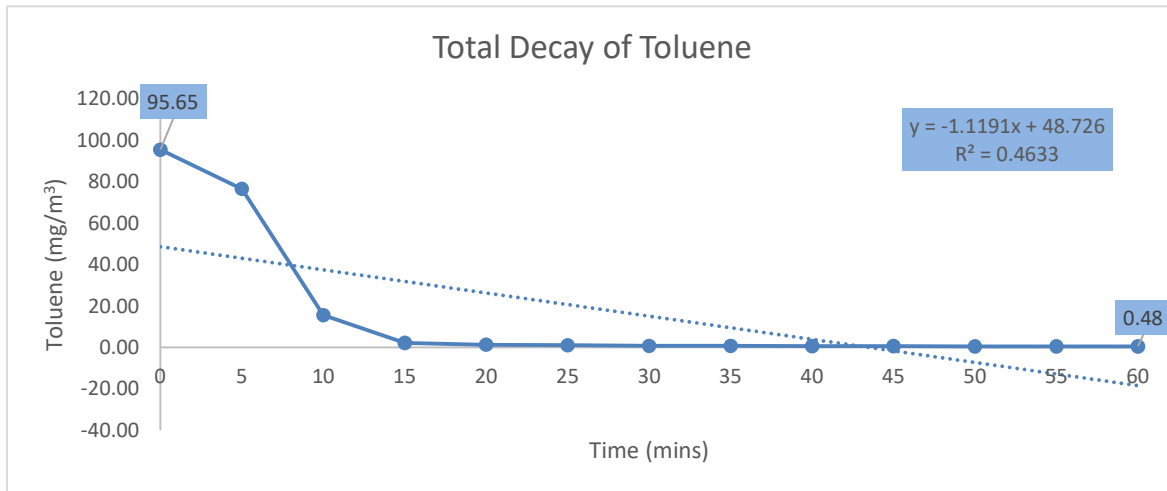


Figure b. Total Decay of Toluene

Calculation:

$$A_1 = \frac{C_0 - C_{60}}{C_0}$$

$$A_2 = \frac{C_{N0} - C_{N60}}{C_{N0}}$$

$$\text{Removal Efficiency} = \frac{C_0(1 - A_2) - C_{60}}{C_0(1 - A_2)}$$

A₁: Removal rate (%)
 A₂: Natural decay rate (%)
 C: Concentration of testing subject (mg/m³)

***** End of Report *****