et-projekt Asia Pacific Limited

Performance Test (Removal of Hydrogen Sulfide) of
Liquid Deodorant SV-000887 SinoAir SEV –S
Kenzentra

Test Report

June 2013

Approved By:

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(Laboratory Manager)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

WELLAB accepts no responsibility for changes made to this report by third parties.

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1 OBJECTIVE

1.1 The test was performed by Wellab Limited on between 14th June and 18th June 2013 and the objective of the test was to determine the removal efficiency of a Liquid Deodorant called "SV-000887 SinoAir SEV –S Kenzentra".

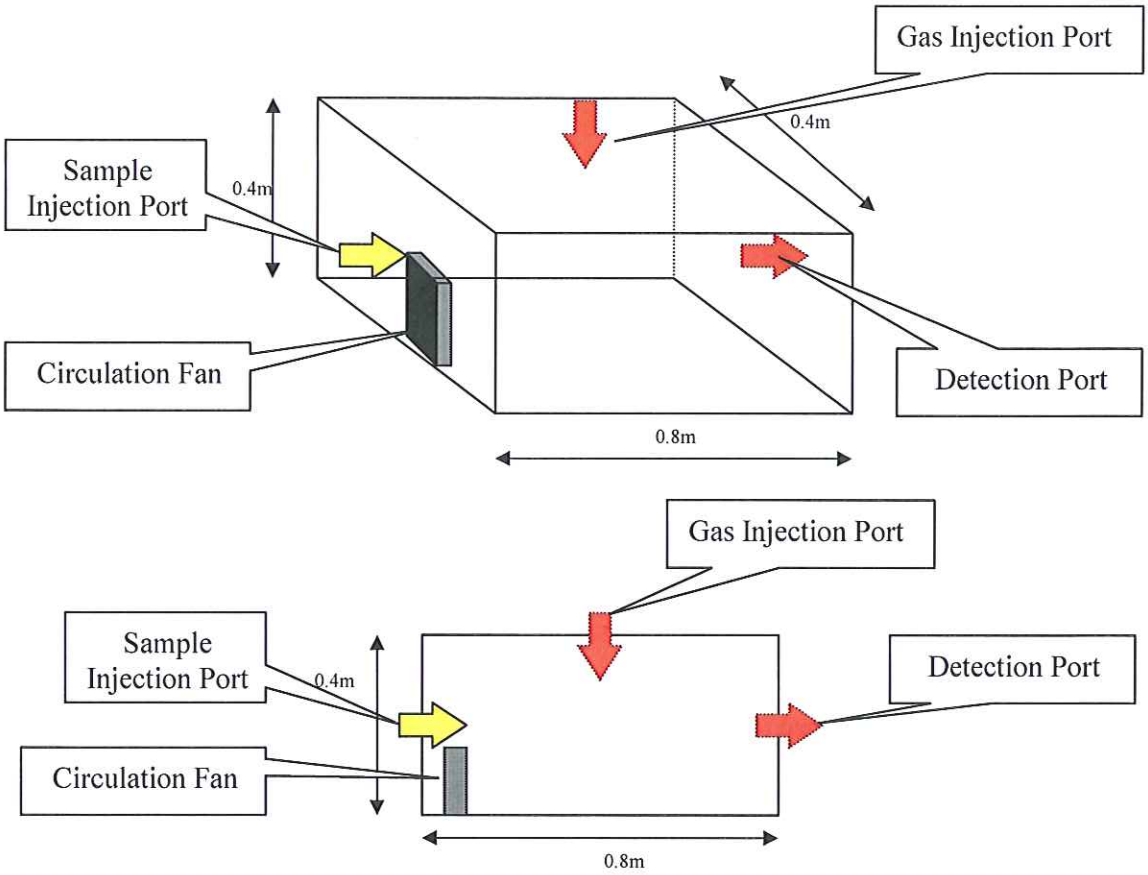
1.2 On 14th June 2013, one bottle the Liquid Deodorant was received by Wellab for testing its efficiency in removing hydrogen sulfide gas of a known concentration.

1.3 Wellab Limited is a HOKLAS accredited laboratory for performing various tests and the Registration Number is 083. Appendix A gives the Registration Certificate.

2 THE REACTION CHAMBER

2.1 The testing methodology has been specified and the details are provided in following paragraphs.

2.2 An air-tight reaction chamber was established with size 0.4m x 0.4m x 0.8m. A schematic drawing is shown in the following diagram:



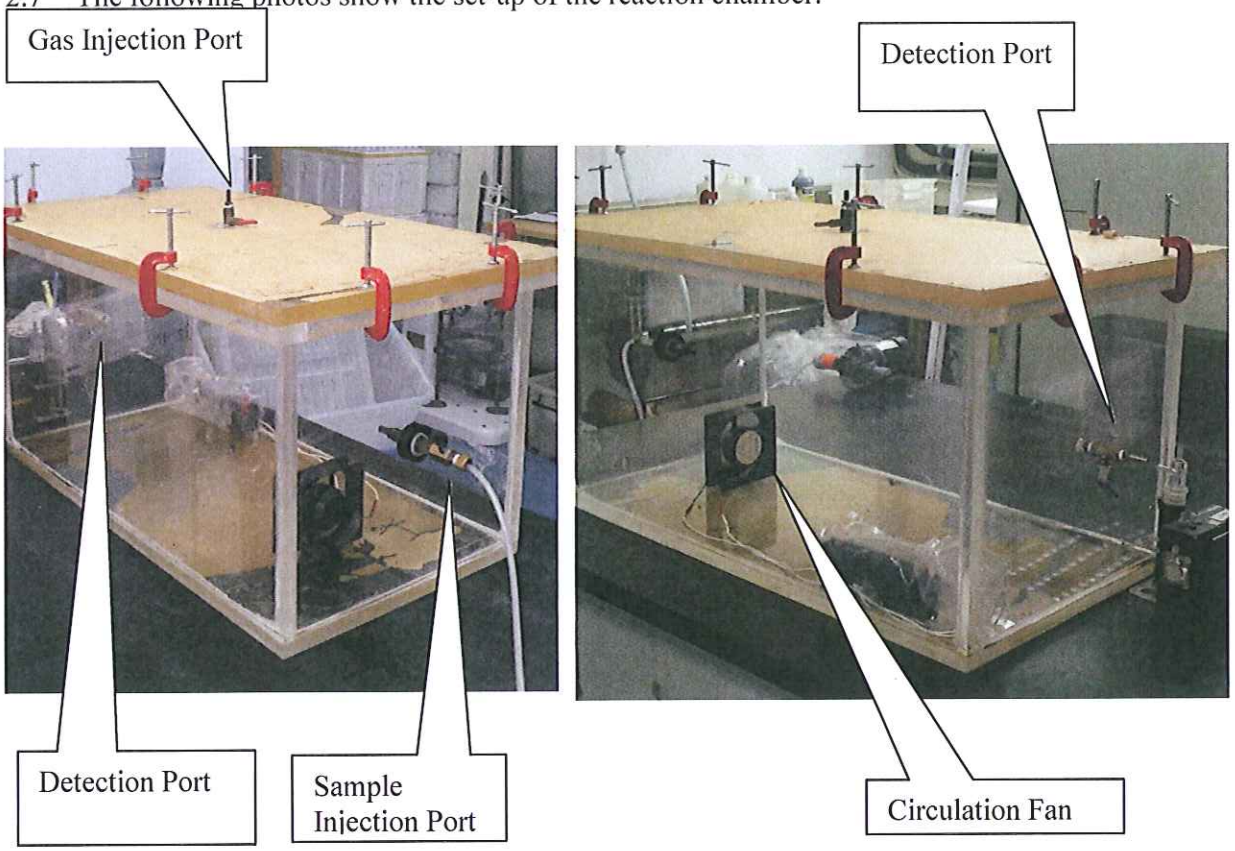
2.3 In the chamber, a circulation fan has been installed near the sample injection port to disperse the Disinfectant sample.

2.4 The reaction chamber has one sample injection port, which is centrally located on the side for the application of Disinfectant sample. According to the tender specification requirement, the sample injection port was equipped with a 0.3 mm orifice diameter nozzle.

2.5 The reaction chamber also has a separate gas injection port, which is located at the top of the chamber, for introducing hydrogen sulfide (H_2S) gas to fill the chamber.

2.6 A detection port was set directly opposite to the sample injection port, in the reaction chamber. The detection port was used for collecting air sample inside the chamber by an air pump for H_2S gas measurement.

2.7 The following photos show the set-up of the reaction chamber:



3 TESTING PROCEDURES

3.1 During the test, the reaction chamber was filled with H_2S gas through the gas injection port and allow for mixing/stabilization after introduction of the H_2S gas by operating the circulation fan. The reaction chamber was stabilized at normal laboratory room temperature/relative humidity and without any pH adjustment. This initial H_2S concentration ($\mathbf{C_i}$) within the chamber should be at the targeted level of 25 ± 5 mg/m^3.

3.2 After mixing/stabilization, an air sample from the chamber through the detection port was collected and measured its H_2S gas according to ISC 3rd ed. 701[1] . The rate of air sampling rate was suitably adjusted such that the air sampling time was at least 1 minute while the minimum detection level of 1 mg/m^3 can be attained for the H_2S measurement. The temperature and relative humidity within the reacting chamber were recorded as well.

3.3 A blank test was carried out with the chamber without injection of any Disinfectant sample. Another air sample was collected through the detection port and the H_2S gas concentration at 60 minutes after mixing/stabilization was measured. For this blank test, the difference between measured H_2S concentration (C_b) within the chamber after 60 minutes from the initial concentration (C_i) should not be more than 2 mg/m^3.

3.4 A specified volume (V) of Disinfectant sample through the sample injection port was applied at an appropriate injection rate (in mL/min) such that the injection period is not more than 60 seconds. The unit of V should be mL. The dilution factor (F) for the prior dilution of the Disinfectant sample before injection was also recorded.

3.5 An air sample was collected from the chamber through the detection port 60 minutes after application of the Disinfectant sample. The H_2S gas concentration (C_s) in the air sample was measured. The temperature and relative humidity within the reaction chamber were also recorded. The amount of the Disinfectant sample injected should be sufficient to reduce the H_2S concentration (Cb) by at least 90% in 60 minutes.

[1] All H_2S measurements in this project refer to "Determination of Hydrogen Sulfide Content of the Atmosphere" where ISC refers to Intersociety Committee, Methods of Air Sampling and Analysis, 3rd edition 1989, James P. Lodge, Jr. editor, Lewis publishers, USA.

4 TEST RESULTS

4.1 The performance test was conducted on 18th June 2013. The test results are shown below:

Condition of the Reaction Chamber	
Volume of the Chamber	0.128 m^3 (0.4 m x 0.8 m x 0.4 m)
Temperature (°C)	22.4
Relative Humidity (%)	64
Blank Test	
H_2S conc (C_i, mg/m^3)	26.724
H_2S conc. (C_b, mg/m^3)	25.896
Deodorant Sample Test	
H_2S conc (C_b, mg/m^3)	25.896
Injection Rate (mL/min)	42
Time of Injection (sec)	60
Volume of Deodorant Sample (mL)	42
Dilution Factor (F)	400
H_2S conc. (C_s, mg/m^3)	2.354
Removal of H_2S Efficiency (%)	90.9
Weight of H_2S Absorbed (W, mg)	$W = (C_b - C_s) \times$ Volume of Chamber $= (25.896-2.354) \times 0.128$ $= 3.013$
Absorption Capacity (A)	$A = \frac{WF}{V}$ $= \frac{3.013 \times 400}{42}$ $= 28.695$

5 CONCLUSION

5.1 The test results show that the amount of the liquid deodorant, "SV-000887 SinoAir SEV –S Kenzentra", could reduce at least 90% hydrogen sulfide content in 60 minutes after injection for 60 seconds.

5.2 Based on the test results, the Absorption Capacity of the liquid deodorant, "SV-000887 SinoAir SEV –S Kenzentra", is 28.695