Volatile Organic Compound Monitor

Test Certificate

Product	**FBXVQM**
Manufacturer	**FORBIX SEMICON**
Hardware variant	1. **FBXVQMW** 2. **FBXVQMG**
Software variant	**v1.35**
Software patch variant	**-**
LCD variant	**3.2**
Backlight variant	**3.2**
Design variant	**2516**
Date submitted for testing	*01/Sep/2014*
Date of test completion	*26/Sep/2014*
Date of certification	*11/Nov/2014*
Place / lab of testing	*FORBIX SEMICON, air quality monitor testing facility laboratory*

FORBIX SEMICON

Bangalore, India

Test Intension and procedure:

The intension of the test procedure is to check the sensitivity of the VOC monitor unit, when subjected to various different volatile organic gaseous compounds.

The test procedure mandates the VOC monitor FBXVQMW/FBXVQMG to be held under controlled environment and subject to predetermined amount of target gas for a specific duration of time and note the reading as shown by the monitor. The readings shown by the monitor need to be correlative to the amount of organic compound gas in the environment that it is subjected to during the testing procedure.

Test Environment:

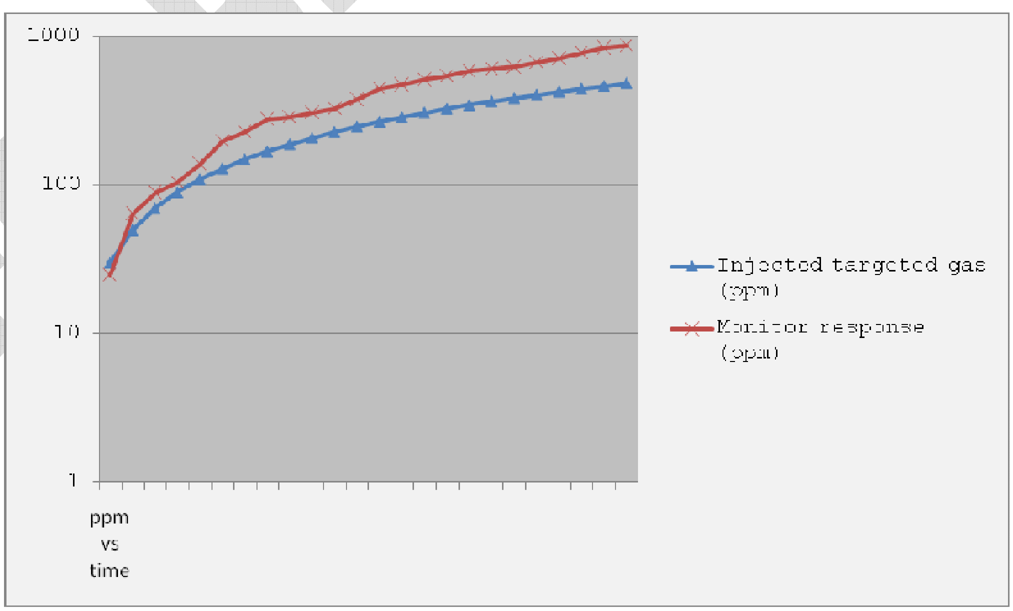
The test environment consists of a glass chamber of size 2 feet x 2 feet x 2 feet (LxBxH) and 2 orifices tightly sealed with rubber caps. One of the orifices is used to inject targeted gas in known quantity (at the beginning of the testing procedure) and the other orifice is used to draw the gas out using vacuum pump (at the end of the testing procedure).

- The unit under test is kept in the glass chamber for a predetermined amount of time after power up (**settling time**). The temperature is maintained at room temperature and humidity that would be mentioned under the testing conditions report
- After the settling time, a predetermined amount of time a known quantity of targeted gas is pumped in the chamber for a predetermined time (**insertion time**)
- The gas is allowed to spread all across the chamber with a sealed blower in the chamber. This time is the **idling time**. It is made sure that the gas chamber is sealed air tight.
- The monitor will start to react to the targeted gas within a time **reaction time**
- After the gas as evenly circulated and spread all throughout the chamber, the reading of the monitor is again noted at equal time intervals (**monitoring time**)
- The VOC monitor is allowed to stay in the chamber with the targeted gas for a time (**exposure time**)
- Following to which, the targeted gas is removed from the gas chamber using a vacuum pipe. Eventually the VOC monitor gas readings will drop (**disintegration time**)
- The monitor and chamber is allowed to stay in this position with no targeted gas again for a settling time.
- The procedure is repeated for various different targeted gases

Targeted gas	**Benzene (C_6H_6)**
Test temperature	**22 °C**
Test temperature	**45 %rH**
Settling time	**30 minutes**
Insertion time	**15 seconds**
Idling time	**60 seconds**
Monitoring time	**60 seconds**
Disintegration time	**10 minutes**
No. of times test procedure repeated	**18 times**

Test results:

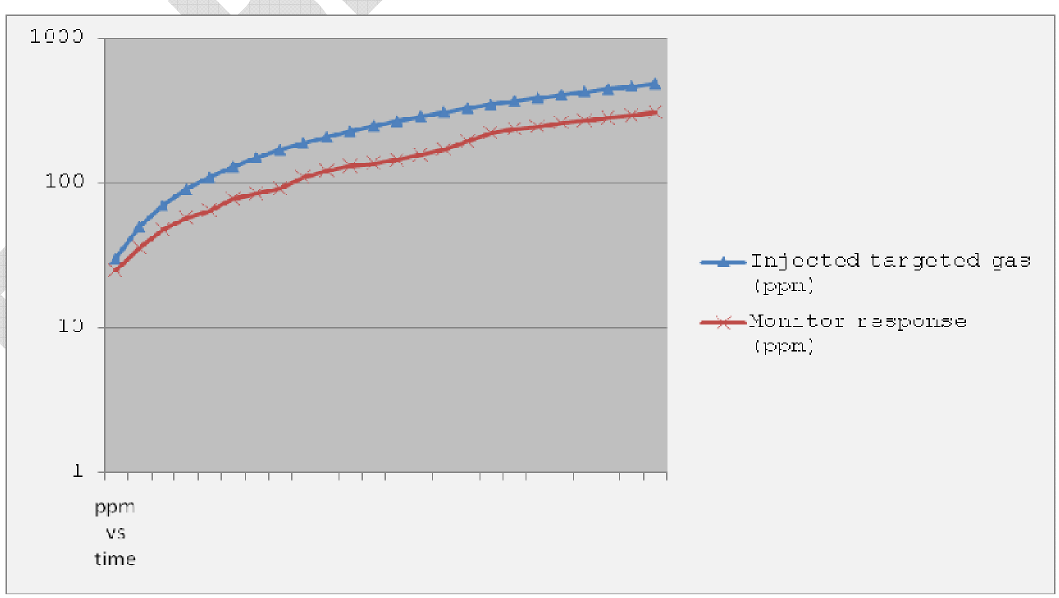
Average reaction time over all the readings	**15 seconds**
Fastest reaction time	**3 seconds**
Slowest reaction time	**20 seconds**
Injection gas concentration	**20 to 500 ppm**
Maximum off readings	**307 ppm**



Targeted gas	**Toluene and Xylene**
Test temperature	**22 °C**
Test temperature	**45 %rH**
Settling time	**30 minutes**
Insertion time	**15 seconds**
Idling time	**60 seconds**
Monitoring time	**60 seconds**
Disintegration time	**10 minutes**
No. of times test procedure repeated	**18 times**

Test results:

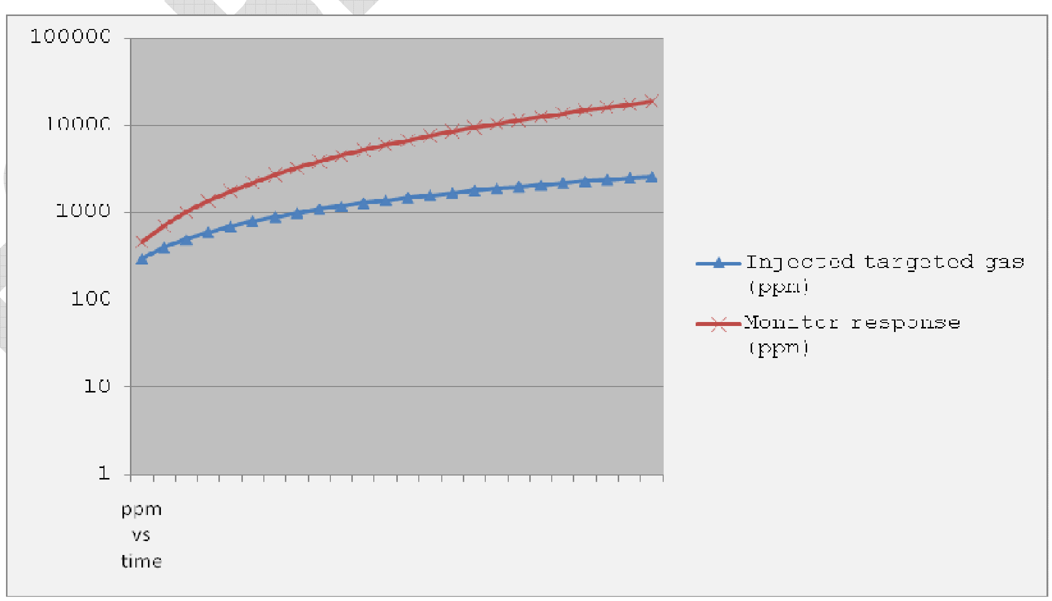
Average reaction time over all the readings	**22 seconds**
Fastest reaction time	**7 seconds**
Slowest reaction time	**32 seconds**
Injection gas concentration	**20 to 500 ppm**
Maximum off readings	**183 ppm**



Targeted gas	**Butane**
Test temperature	**22 °C**
Test temperature	**45 %rH**
Settling time	**30 minutes**
Insertion time	**15 seconds**
Idling time	**60 seconds**
Monitoring time	**60 seconds**
Disintegration time	**10 minutes**
No. of times test procedure repeated	**18 times**

Test results:

Average reaction time over all the readings	**2 seconds**
Fastest reaction time	**1 seconds**
Slowest reaction time	**8 seconds**
Injection gas concentration	**200 to 3000 ppm**
Maximum off readings	**1358 ppm**



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9. Document History

Revision / Date	Approved	Description / Changes
Nov-2014	Yes	Initial Release

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