VOLATILE ORGANIC COMPOUNDS
EMISSIONS COMPLIANCE TESTING
AT PAXFORD COMPOSITES LTD IN MARCH 2010

FOR: Paxford Composites Ltd
2-4 Redwongs Way
Huntingdon
Cambridgeshire
PE29 7HB

FAO: Mr Neil Search

Work By: K C Blakley and M R Ellison

Date of issue: **NPL Authorised Signature**

Name:

MCerts Level 2 Approver **Signed:** **for Managing Director**

Name: Kevin Blakley

Signature: **MCERTs No: MM-03-317**

Part 1: - Executive Summary –Compliance Report			
Process Operator **Paxford Composites Ltd**		LA Permit No **B01/02**	
		Site Specific Protocol Reference **PX02MAR10\SSP**	
Address **Paxford Composites Ltd** **2-4 Redwongs Way** **Huntingdon** **Cambridgeshire** **PE29 7HB**		Contact **Neil Search**	
		Tel No **01480 453537**	
		Email neil.search@paaxfordcomposites.co.uk	
Tests carried out	**Compliance VOCs of 3 Spray Booths**	Dates tests carried out **31st March 2010**	
Testing laboratory **National Physical Laboratory**		UKAS Accreditation No **0002**	
Address **Hampton Road** **Teddington** **TW11 OLW**		Contact **Kevin Blakley**	
		Tel No **020 8943 6118**	
		Email **kevin.blakley@npl.co.uk**	
Species to be monitored	**Volatile Organic Compounds**		
Emissions Limit Values (ELV)	**Volatile Organic Compounds - 150 mg m^{-3} (expressed as carbon)**		
Compliance with standards		**Yes**	
Deviations from standards			**No**
Corrective actions required			**No**
Test Team	**Kevin Blakley and Matthew Ellison**		
Full report reference number		**PX02MAR10**	
Summary report submitted by **Kevin Blakley**		Signature	MCERTs ID No: - **Level 2, TE1,2,3,4**

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1.1 MONITORING OBJECTIVES

NPL were awarded a contract by Paxford Composites Ltd to conduct emissions compliance testing at their facility located in Huntingdon, Cambridgshire. Work was conducted on the 18th February to make the necessary measurements from their spray painting enclosures, known as Spray Booth 1 (SB1), Spray Booth 2 (SB2) and Spray Booth 3 (SB3).

The requirements of the contract were to quantify volatile organic compounds (VOC's) from the sources described above over a 30-minute period.

VOC concentrations are expressed as carbon at reference conditions of 273.15K, 101.325 kPa on a wet gas basis.

1.2 VOC MONITORING RESULTS

Field	Units			
Stack I.D.		**SB1**	**SB2**	**SB3**
Date		31/03/2010	31/03/2010	31/03/2010
Sample Period (BST)	From hh:mm	10:15	12:45	14:00
	To hh:mm	10:45	13:15	14:30
Sample Duration	min	30	30	30
30-minute mean Concentration for Period	mg m^{-3}, Ref. Conditions	**20.5**	**30.9**	**25.3**
Expanded Uncertainty	mg m^{-3}, 95% conf. k=2	+/-1.3	+/-1.4	+/-1.4
Emission Limit Value (ELV)	mg m^{-3}, Ref. Conditions	150	150	150
Percentage of ELV	%	14	21	17
Reference Conditions	273.15K, 101.325 kPa, Wet Gas Basis			

Notes: -
The VOC (mg/m^3) results above are expressed as Carbon and these were calculated using the prescribed method described in the Environmental Agency Technical Guidance Note M16 for Volatile Organic Compounds.

1.3 PLANT AND EQUIPMENT OPERATING INFORMATION

1.3.1 Paxford Composites Spray Booths 1-3

The spray booths at Paxford Composites consist of three sealed rooms, approximately the size of a large household car garages. They are used as batch processes and air is pumped into the booths from outside the building and the spray painting process is carried out manually using 2 to 3 skilled workers. The air inside the booth can be heated if required for curing treatment of the components. Owing to the business requirements, many layers of paint are required to achieve the smooth finish. As a result, a typical single layer spray time would normally be approximately 20 minutes but depends on the size and type of item being sprayed. This process is then repeated after the item has been brushed down and ready for a further coating. The paint filled air inside the booths are removed via ceiling filters (which covers the entire surface areas of the ceilings) to remove particulate matter. The air is then exhausted to atmosphere.

On each spray booth, the sample position was downstream of the particulate filters. The sample points were 10mm holes, suitable for monitoring VOCs to the relevant CEN Standard, See Figures 1-3.

At the time of monitoring, spray painting workers were asked to carry out their normal task in order to create representative conditions of routine activity within the spray booths. It should be noted that at the time of monitoring, there were no items being physically sprayed, therefore all of the paint would have been expelled through the exhaust ducting rather than coating surfaces of the items. It was the site's opinion that this may lead to higher levels of VOCs being emitted than would usually be seen.

1.4 MONITORING DEVIATIONS

The testing was fully compliant with the relative standard BS EN13526: 2002. See Appendix 1 for Test Techniques and Protocols.

1.5 CONCLUSIONS

Concentrations of volatile organic compounds, measured from the three spray booths at Paxford Composites Ltd, were carried out on the 31st March 2010.

Particulates monitoring could not be undertaken as required in the sites permit due to the size of the ports available. Therefore, it is recommended the site fit suitable ports to allow the particulate monitoring to be undertaken as described in BS EN15259: 2007.

1.6 REFERENCES

1. Guidance on Assessing Measurement Uncertainty in Stack Emissions Monitoring, by Pullen J and Robinson R, Source Testing Association, Quality Guidance Note QGN1.

Part 2: - Supporting Information–Compliance Report			
Process Operator **Paxford Composites Ltd**		LA Permit No **B01/02**	
		Site Specific Protocol Reference **PX02MAR10\SSP**	
Address **Paxford Composites Ltd** **2-4 Redwongs Way** **Huntingdon** **Cambridgeshire** **PE29 7HB**		Contact **Neil Search**	
		Tel No **01480 453537**	
		Email neil.search@paxfordcomposites.co.uk	
Tests carried out	**Compliance VOCs of 3 Spray Booths**	Dates tests carried out **31st March 2010**	
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Address **Hampton Road** **Teddington** **TW11 OLW**		Contact **Kevin Blakley**	
		Tel No **020 8943 6118**	
		Email **kevin.blakley@npl.co.uk**	
Species to be monitored	**Volatile Organic Compounds**		
Emissions Limit Values (ELV)	**Volatile Organic Compounds - 150 mg m^{-3} (expressed as carbon)**		
Compliance with standards		**Yes**	
Deviations from standards			**No**
Corrective actions required			**No**
Test Team	**Kevin Blakley and Matthew Ellison**		
Full report reference number		**PX02MAR10**	
Summary report submitted by **Kevin Blakley**		Signature	MCERTs ID No: - **Level 2, TE1,2,3,4**

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2.1 APPENDIX 1

2.1.1 Emission Testing Personnel Information

NAME	NPL Position	MCerts I.D. No.	Level/Endorsements	Function
Matthew Ellison	RS	MM-05-682	Level 2, TE1, TE2, TE3, TE4	Team Leader
Kevin Blakley	SRS	MM-03-317	Level 2, TE1, TE2, TE3, TE4	Team Leader

2.1.2 Test Techniques and Protocols

Date of Tests	31st March 2010
Main Pollutants Measured	1. Volatile Organic Compounds (VOCs)
Test Methods	1. Flame Ionisation Detector, Sick-Maihak. Serial No. AS0202 to BS EN 13526:2002. MCertified Instrument No – Sira MC 040037/02
Procedure	1. **QPAS B 538**:- STACK GAS SAMPLING FOR CARBON MONOXIDE, CARBON DIOXIDE, OXYGEN, SULPHUR DIOXIDE, VOLATILE ORGANIC COMPOUNDS AND NITROGEN OXIDES USING EXTRACTIVE INSTRUMENTAL TECHNIQUES.

2.2 APPENDIX 2

2.2.1 Sample Point Details

Figure 1. Spray Booth 1 Sample Position

Figure 2. Spray Booth 2 Sample Position

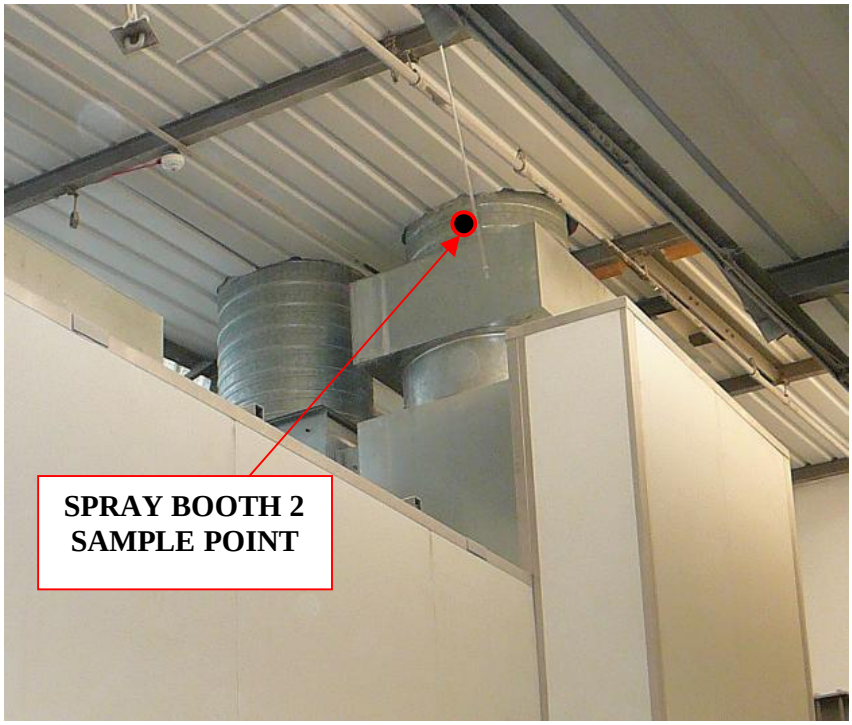
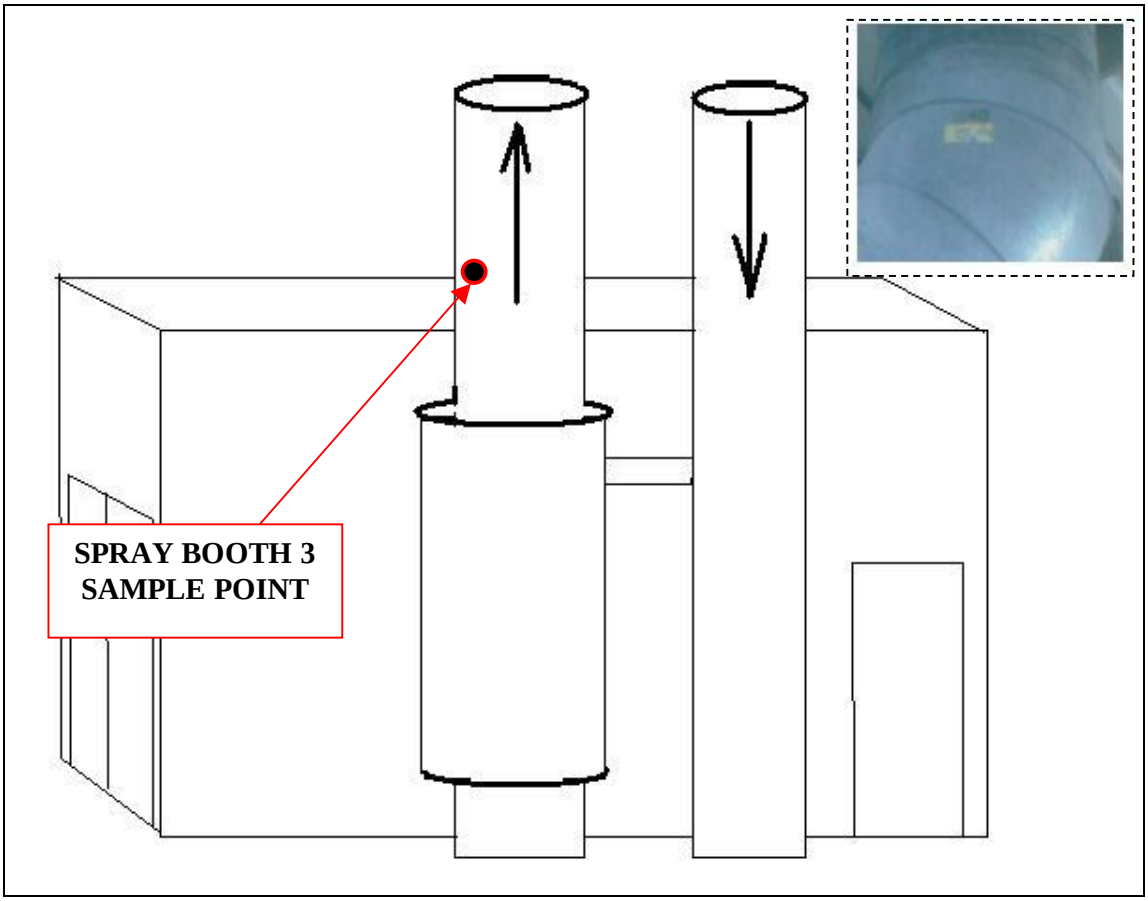
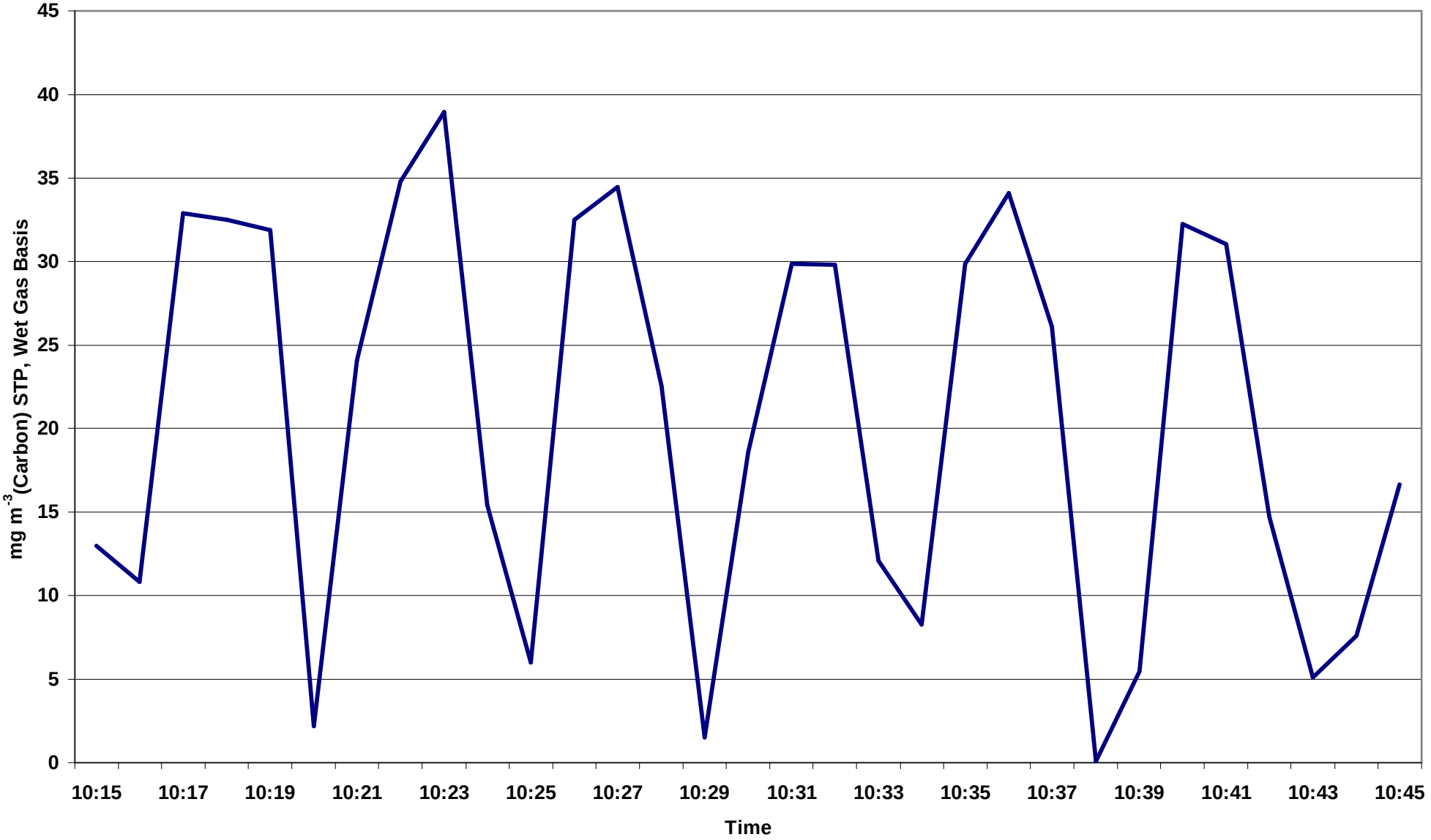


Figure 3. Spray Booth 3 Sample Position

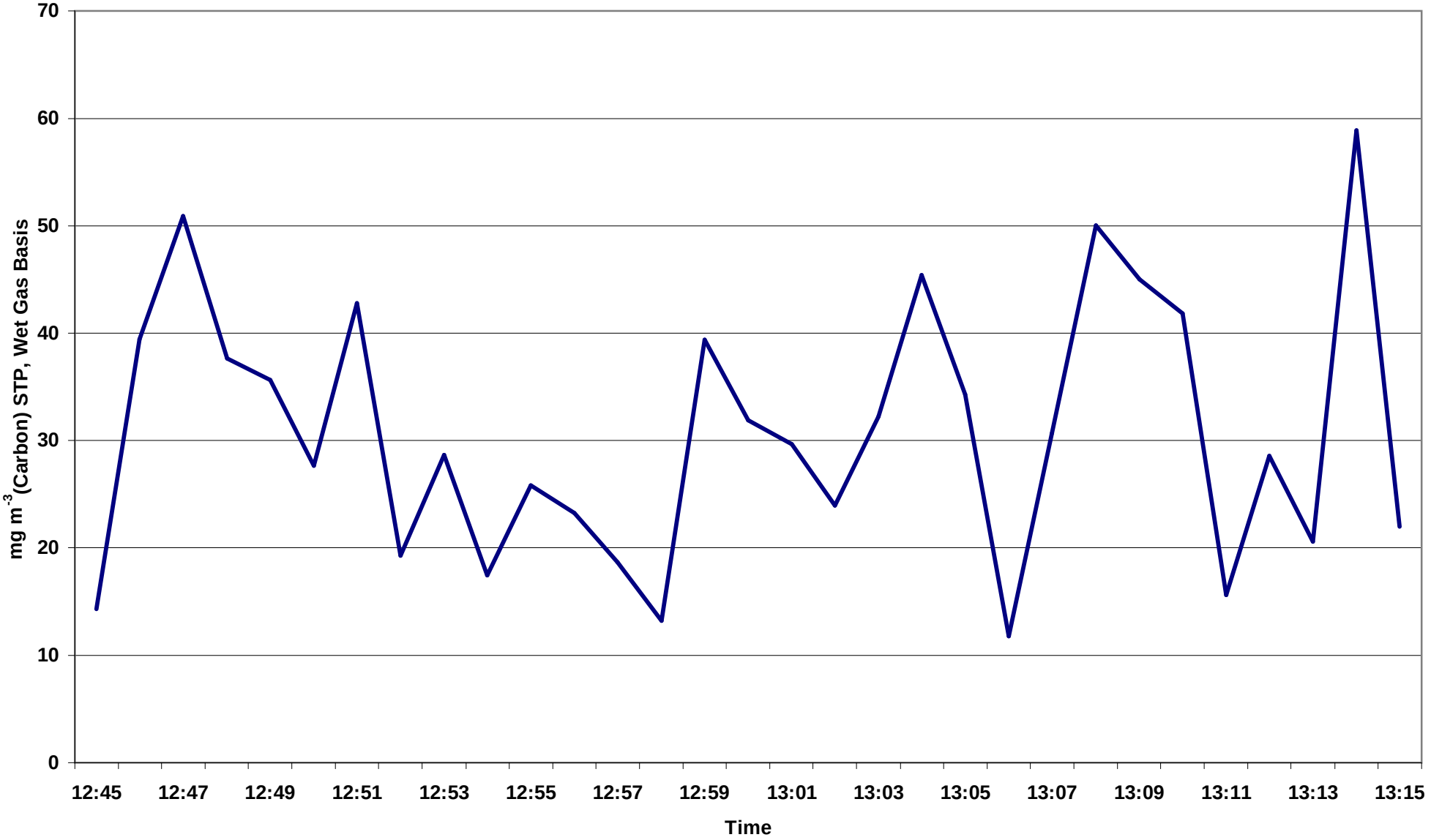


2.2.2 VOC 1 Minute Averaged Graphs

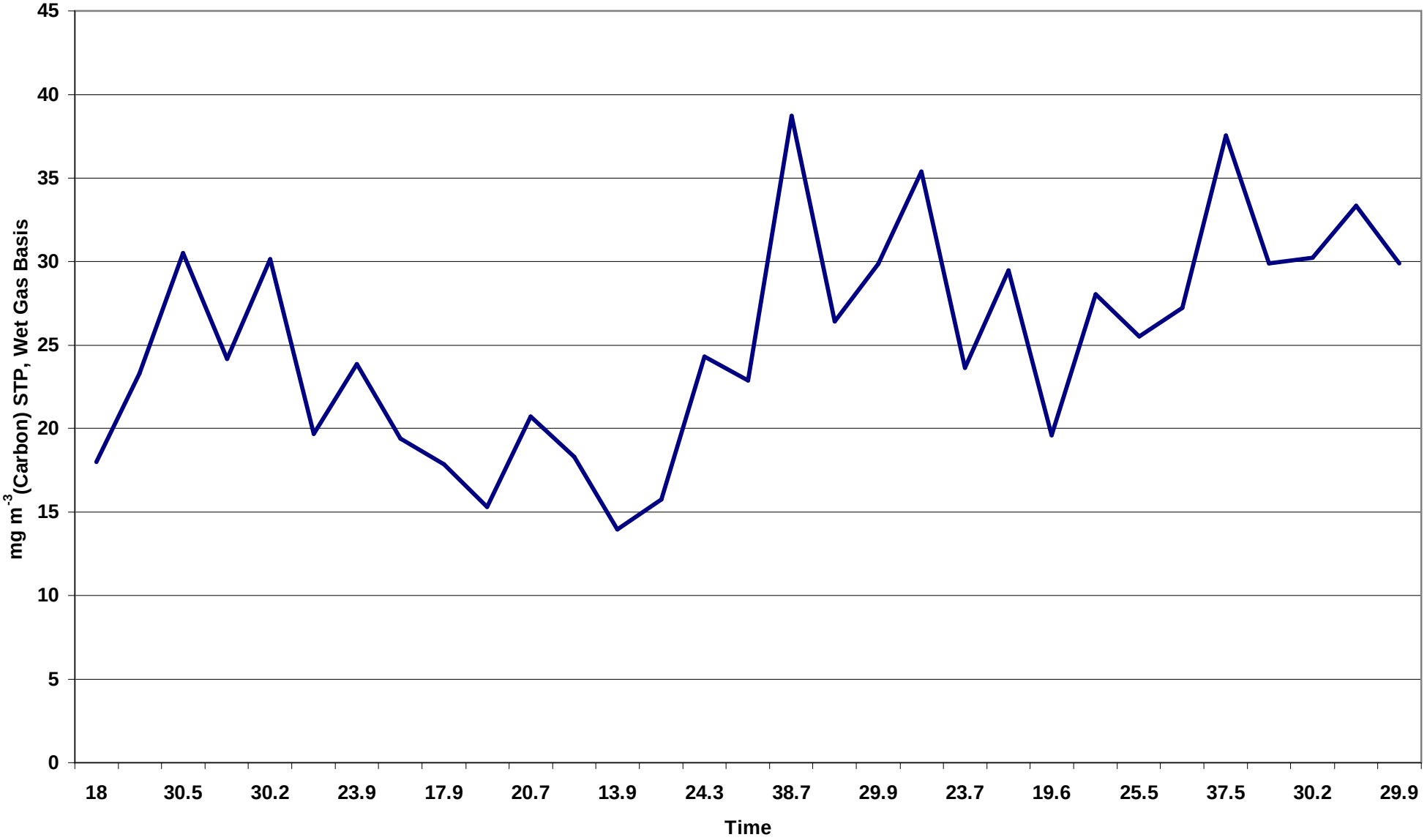
2.2.2.1 Figure 4. Spray Booth 1. 1-Minute Averages of Volatile Organic Compounds (VOC). Expressed as mg m^{-3} (Carbon) at 273K, 101.3kPa, Wet Gas Basis



2.2.2.2 Figure 5. Spray Booth 2. 1-Minute Averages of Volatile Organic Compounds (VOC). Expressed as mg m^{-3} (Carbon) at 273K, 101.3kPa, Wet Gas Basis



2.2.2.3 Figure 6. Spray Booth 3. 1-Minute Averages of Volatile Organic Compounds (VOC). Expressed as mg m^{-3} (Carbon) at 273K, 101.3kPa, Wet Gas Basis



2.2.3 Gas Measurements

Calibration Log

	Instrument SN: AS-0202	Type: O2 / VOC			Job No: PAX02MAR10				Page No: 2 of 3
	Mobile Lab:		NPL		Client Site: PAXFORD COMMOSITES				
					Other Equipment: NONE			A3	
Gas Cyl. No.	115985	Gas Cyl Conc.	51.4	Package % vol / ppm	Date: 31/3/10		Instrument Range:	0-100 ppm	

Cal Type	Time (Start and Finish)	Initial Reading (V)	Initial Gain/Setting (if app.)	Final Reading (V)	Final Gain/Setting (if app.)	System(S) / Direct(D)	Total Regulator Pressure (bar/Psi delete as app.)	Comment	Signature
Check Zero	14:45	0.064	4.75			D	210	Zero drift: <2 %	ZNB
Zero Adj	14:46			0.007	4.65	D		Span Drift: <2 %	ZNB
Check Span	14:47	5.109	2.71			D	60	Response Time: 20 sec	ZNB
Span Adj	14:48			5.142	2.73	D		Span Value: 51.4 %	ZNB
Check Zero	14:49	0.002	4.65			D	210		ZNB
Check Zero	15:22	0.009	4.65			D	210		ZNB
Check Span	15:23	5.062	2.73			D	60		ZNB
Zero Adj									
Span Adj									
Check Zero	15:25	0.005	2.73			D	210		ZNB

	Instrument SN:	Type: CO2							
	Mobile Lab:		NPL						
Gas Cyl. No.		Gas Cyl Conc.		% vol	Date.		Instrument Range:		

Cal Type	Time (Start and Finish)	Initial Reading	Initial Gain/Setting (if app.)	Final Reading	Final Gain/Setting (if app.)	System(S) / Direct(D)	Total Regulator Pressure (bar/Psi delete as app.)	Comment	Signature
Check Zero								Zero drift: ___ %	
Zero Adj								Span Drift: ___ %	
Check Span								Response Time: ___ sec	
Span Adj								Span Value: ___ %	
Check Zero									
Check Zero									
Check Span									
Zero Adj									
Span Adj									
Check Zero									

Distribute to Job File

IF REGULATOR PRESSURE IS LESS THAN 500 PSI (35 bar) CONTACT SUPPLIER IMMEDIATELY

MCERTS LEVEL2 with TE4
MCERTS ID: MM-03-317

Name: K. Blakley

NPL Ltd: 15 OCT 2009
Author: KCB

Revision 3
QPAS B 538

Calibration Log

Instrument SN: AS-0202	Type: ~~SO2~~			Job No: PAX02 MAR10					Page No: 1 of 3	
Mobile Lab: TRANSIT	VOC	NPL		Client Site: Paxford composites - A1						
				Other Equipment:						
Gas Cyl. No. 115985		Gas Cyl Conc. 51.4 ppm PROPANE		Date. 31/03/10			Instrument Range: 0-100 ppm ~~0-200~~			
Cal Type	Time (Start and Finish)	Initial Reading (V)	Initial Gain/Setting (if app.)	Final Reading (V)	Final Gain/Setting (if app.)	System(S) / Direct(D)	Total Regulator Pressure (bar/Psi delete as app.)	Comment		Signature
Check Zero	10:17	0.248	4.80			D	3000psi	Zero drift: <2 %		WS
Zero Adj	10:18			0.002	4.64	D		Span Drift: <2 %		WS
Check Span	10:21					D	60Bar	Response Time: 20 sec		WS
Span Adj	10:23	5.380	2.68	5.148	2.58	D		Span Value: 51.4 ppm		WS
Check Zero	10:25	4.64	0.003			D	3000psi			WS
Check Zero	12:20	0.001	4.64			D	3000psi			WS
Check Span	12:23	5.192	2.58			D	60Bar			WS
Zero Adj										
Span Adj										
Check Zero	12:24	0.002	4.64			D	3000psi			WS

Instrument SN: AS-0202	Type: ~~SO~~			Job No: PAX02 MAR10						
Mobile Lab:	VOC	NPL		Client Site: Paxford composites - A2						
				Other Equipment:						
Gas Cyl. No. 115985		Gas Cyl Conc. 51.4 ppm PROPANE		Date. 31/3/10			Instrument Range: 0-100 ppm.			
Cal Type	Time (Start and Finish)	Initial Reading (V)	Initial Gain/Setting (if app.)	Final Reading (V)	Final Gain/Setting (if app.)	System(S) / Direct(D)	Total Regulator Pressure (bar/Psi delete as app.)	Comment		Signature
Check Zero	11:46	-0.3	-			D	3000psi	Zero drift: <2 %		
Zero Adj	11:48			-0.01	-	D		Span Drift: <2 %		
Check Span	11:52					D	60Bar	Response Time: 20 sec		
Span Adj	11:54	4.919	-	5.138	-	D		Span Value: 51.4 ppm		
Check Zero	11:57	0.009	-			D	3000psi			
Check Zero	14:15	0.007	-			D	3000psi			
Check Span	14:17	5.129	-			D	60Bar			
Zero Adj										
Span Adj										
Check Zero	14:19	0.003	-			D	3000psi			

Distribute to Job File

IF REGULATOR PRESSURE IS LESS THAN 500 PSI (35 bar) CONTACT SUPPLIER IMMEDIATELY

MCERTS LEVEL2 with TE4
MCERTS ID: MM-03-317

Name: K. BLAKLEY

2.2.4 Calculations Used in Reporting Results

The following equation can be used to convert propane volume concentrations to total organic carbon mass concentrations:

$$C_m = C_v \frac{3 \text{ x } M_c}{V_m} \text{ mg/m}^3$$

where:-

C_m is the TOC concentration in milligrams per cubic metre (273 K;1013 hPa).
C_v is the volume concentration of propane in ppm (by volume).
M_c is the molar mass of carbon (=12 g/mole).
V_M is the molar volume (=22,4 l/mole).

2.2.5 Uncertainty Calculations

Uncertainty calculation for Gaseous Measurement BS EN 13526 VOCs

SPRAY BOOTH 1

Limit value	150	**mg.m^{-3} (corrected) Carbon**	**Gas**	Propane	
			Full Scale	100	**ppm**
Measured concentration	12.77	**ppm**	**Cal gas conc**	51.4	**ppm**
Measured concentration	20.50	**mg.m^{-3} (273K, 101.3kPa) Carbon**	**Conversion**	0.62305296	
			Full Scale	62.30529595	**mg.m^{-3} (Carbon)**
			Cal gas conc	32.02492212	**mg.m^{-3} (Carbon)**

Correction for reference conditions					
		O2, %	**Moisture, %**	**Pressure, KPa**	**Temperature, K**
	ref	21.00	0.00	101.30	**273.00**
	measured	21.00	0.00	101.30	**273.00**
Factors		1.00	1.00	1.00	1.00
Correction Factor		**1.00**			

Performance characteristics	**Value**			**specification**
Response time	20	seconds		180.000
Number of readings in measurement	30			
Repeatability at zero	0.005	% full scale		0.200
Repeatability at span level	0.083	% full scale		2.000
Deviation from linearity	-1.46	% of value		2.000
Zero drift	0	% full scale		2.000
Span drift	0	% full scale		2.000
volume or pressure flow dependence	0.02	% of full scale/kPa		0.033
atmospheric pressure dependence	0	% of value/kPa		0.750
ambient temperature dependence	0.025	% full scale/10K		0.300
NH3 (20 mg/m3)	0	mg/m3		
CO2 (15%)	0	% by vol		
H2O (30%)	0.0	% by vol		4.000
dependence on voltage	1.05	% full scale/10V		2%fs/10V
losses in the line (leak)	0	% of value		2% of value
Uncertainty of calibration gas	2	% of value		

Effect of drift	
0.00	mg/m3
0.00	% value

	ranges min	max	value at calib
flow	1.9	2.1	2
pressure	101.30	101.3	101.3
temp	289	289	289
NH3 range	0	0	0
CO2 range	0	15	0
H2O range	0	0	0
Instrument Voltage Rating			110
Voltage	104.5	115.5	110

Measurement performance related to stationary conditions

Performance characteristic		**Uncertainty**		**Value of uncertainty quantity**		
Standard deviation of repeatability at zero		u_{r0}		for mean		use rep at span
Standard deviation of repeatability at span level		u_{rs}		for mean		0.02
Lack of fit		u_{fit}				-0.53
Drift		u_{0dr}				0.00
volume or pressure flow dependence		u_{spres}				0.00
atmopsheric pressure dependence		u_{apres}				0.00
ambient temperature dependence		u_{temp}				0.00
NH3 (20 mg/m3)		u_{interf}				0.00
CO2 (15%)						0.00
H2O (30%)						0.00
Dependence on voltage		u_{volt}				0.33
losses in the line (leak)		u_{leak}				0.00
Uncertainty of calibration gas		u_{calib}				0.24

Use largest negative or positive interferent effect	
0	0.00
0	0.00
0	0.00
0	0.00
Interference uncertainty	0.00

Measurement uncertainty		Result	20.50	mg/m^3
Combined uncertainty			0.67	mg/m^3
Expanded uncertainty	k =	2	1.33	mg/m^3
Uncertainty corrected to std conds			1.33	mg.m-3 (corrected)
Expanded uncertainty	**expressed with a level of confidence of 95%**		**0.89**	**% ELV**
Expanded uncertainty	**expressed with a level of confidence of 95%**		**1.33**	**mg.m^{-3}**

Note: Enter values into green boxes
Dark blue boxes indicate information that can be obtained from MCERTS tests

Developed by R Robinson, NPL

NATIONAL PHYSICAL LABORATORY
Continuation Sheet

Uncertainty calculation for Gaseous Measurement BS EN 13526 VOCs

SPRAY BOOTH 2

Limit value	150	**mg.m^{-3} (corrected) Carbon**	**Gas**	Propane	
			Full Scale	100	**ppm**
Measured concentration	19.25	**ppm**	**Cal gas conc**	51.4	**ppm**
Measured concentration	30.90	**mg.m^{-3} (273K, 101.3kPa) Carbon**	**Conversion**	0.62305296	
			Full Scale	62.30529595	**mg.m^{-3} (Carbon)**
			Cal gas conc	32.02492212	**mg.m^{-3} (Carbon)**

Correction for reference conditions					
		O2, %	**Moisture, %**	**Pressure, KPa**	**Temperature, K**
	ref	21.00	0.00	101.30	**273.00**
	measured	21.00	0.00	101.30	**273.00**
Factors		1.00	1.00	1.00	1.00
Correction Factor		**1.00**			

Performance characteristics	**Value**			**specification**
Response time	20	seconds		180.000
Number of readings in measurement	30			
Repeatability at zero	0.005	% full scale		0.200
Repeatability at span level	0.083	% full scale		2.000
Deviation from linearity	-1.46	% of value		2.000
Zero drift	0	% full scale		2.000
Span drift	0	% full scale		2.000
volume or pressure flow dependence	0.02	% of full scale/kPa		0.033
atmospheric pressure dependence	0	% of value/kPa		0.750
ambient temperature dependence	0.025	% full scale/10K		0.300
NH3 (20 mg/m3)	0	mg/m3		
CO2 (15%)	0	% by vol		
H2O (30%)	0.0	% by vol		4.000
dependence on voltage	1.05	% full scale/10V		2%fs/10V
losses in the line (leak)	0	% of value		2% of value
Uncertainty of calibration gas	2	% of value		

Effect of drift
0.00 mg/m3
0.00 % value

	ranges min	max	value at calib
flow	1.9	2.1	2
pressure	101.30	101.3	101.3
temp	289	289	289
NH3 range	0	0	0
CO2 range	0	15	0
H2O range	0	0	0
Instrument Voltage Rating			110
Voltage	104.5	115.5	110

Measurement performance related to stationary conditions

Performance characteristic		**Uncertainty**		**Value of uncertainty quantity**		
Standard deviation of repeatability at zero		u_{r0}		for mean		use rep at span
Standard deviation of repeatability at span level		u_{rs}		for mean		0.02
Lack of fit		u_{fit}				-0.53
Drift		u_{0dr}				0.00
volume or pressure flow dependence		u_{spres}				0.00
atmopsheric pressure dependence		u_{apres}				0.00
ambient temperature dependence		u_{temp}				0.00
NH3 (20 mg/m3)		u_{interf}				0.00
CO2 (15%)						0.00
H2O (30%)						0.00
Dependence on voltage		u_{volt}				0.33
losses in the line (leak)		u_{leak}				0.00
Uncertainty of calibration gas		u_{calib}				0.36

Use largest negative or positive interferent effect	
0	0.00
0	0.00
0	0.00
0	0.00
Interference uncertainty	0.00

Measurement uncertainty		Result	30.90	mg/m^3
Combined uncertainty			0.72	mg/m^3
Expanded uncertainty	k =	2	1.43	mg/m^3
Uncertainty corrected to std conds			1.43	mg.m-3 (corrected)
Expanded uncertainty	**expressed with a level of confidence of 95%**		**0.96**	**% ELV**
Expanded uncertainty	**expressed with a level of confidence of 95%**		**1.43**	**mg.m^{-3}**

Note: Enter values into green boxes
Dark blue boxes indicate information that can be obtained from MCERTS tests

Developed by R Robinson, NPL

NATIONAL PHYSICAL LABORATORY
Continuation Sheet

Uncertainty calculation for Gaseous Measurement BS EN 13526 VOCs

SPRAY BOOTH 3

Limit value	150	**mg.m^{-3} (corrected) Carbon**	**Gas**	Propane	
			Full Scale	100	**ppm**
Measured concentration	15.76	**ppm**	**Cal gas conc**	51.4	**ppm**
Measured concentration	25.30	**mg.m^{-3} (273K, 101.3kPa) Carbon**	**Conversion**	0.62305296	
			Full Scale	62.30529595	**mg.m^{-3} (Carbon)**
			Cal gas conc	32.02492212	**mg.m^{-3} (Carbon)**

Correction for reference conditions					
		O2, %	**Moisture, %**	**Pressure, KPa**	**Temperature, K**
	ref	21.00	0.00	101.30	**273.00**
	measured	21.00	0.00	101.30	**273.00**
Factors		1.00	1.00	1.00	1.00
Correction Factor		**1.00**			

Performance characteristics	**Value**			**specification**
Response time	20	seconds		180.000
Number of readings in measurement	30			
Repeatability at zero	0.005	% full scale		0.200
Repeatability at span level	0.083	% full scale		2.000
Deviation from linearity	-1.46	% of value		2.000
Zero drift	0	% full scale		2.000
Span drift	0	% full scale		2.000
volume or pressure flow dependence	0.02	% of full scale/kPa		0.033
atmospheric pressure dependence	0	% of value/kPa		0.750
ambient temperature dependence	0.025	% full scale/10K		0.300
NH3 (20 mg/m3)	0	mg/m3		
CO2 (15%)	0	% by vol		
H2O (30%)	0.0	% by vol		4.000
dependence on voltage	1.05	% full scale/10V		2%fs/10V
losses in the line (leak)	0	% of value		2% of value
Uncertainty of calibration gas	2	% of value		

Effect of drift	
0.00	mg/m3
0.00	% value

	ranges min	max	value at calib
flow	1.9	2.1	2
pressure	101.30	101.3	101.3
temp	289	289	289
NH3 range	0	0	0
CO2 range	0	15	0
H2O range	0	0	0
Instrument Voltage Rating			110
Voltage	104.5	115.5	110

Measurement performance related to stationary conditions

Performance characteristic		**Uncertainty**		**Value of uncertainty quantity**		
Standard deviation of repeatability at zero		u_{r0}		for mean		use rep at span
Standard deviation of repeatability at span level		u_{rs}		for mean		0.02
Lack of fit		u_{fit}				-0.53
Drift		u_{0dr}				0.00
volume or pressure flow dependence		u_{spres}				0.00
atmopsheric pressure dependence		u_{apres}				0.00
ambient temperature dependence		u_{temp}				0.00
NH3 (20 mg/m3)		u_{interf}				0.00
CO2 (15%)						0.00
H2O (30%)						0.00
Dependence on voltage		u_{volt}				0.33
losses in the line (leak)		u_{leak}				0.00
Uncertainty of calibration gas		u_{calib}				0.29

Use largest negative or positive interferent effect	
0	0.00
0	0.00
0	0.00
0	0.00
Interference uncertainty	0.00

Measurement uncertainty		Result	25.30	mg/m^3
Combined uncertainty			0.69	mg/m^3
Expanded uncertainty	k =	2	1.37	mg/m^3
Uncertainty corrected to std conds			1.37	mg.m-3 (corrected)
Expanded uncertainty	**expressed with a level of confidence of 95%**		**0.92**	**% ELV**
Expanded uncertainty	**expressed with a level of confidence of 95%**		**1.37**	**mg.m^{-3}**

Note: Enter values into green boxes
Dark blue boxes indicate information that can be obtained from MCERTS tests

Developed by R Robinson, NPL