EMISSIONS MONITORING SURVEY

Prepared for:

London Taxis International Ltd
Holyhead Road
Coventry
Warwickshire
CV5 8JJ

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Job Number	: P618
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DOCUMENT CONTROL SHEET

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Date:	18th June 2010	*Date:*	18th June 2010

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1.0 EXECUTIVE SUMMARY

The monitoring at this installation was carried out in accordance with our quotation reference **PC/P618/Q002** for compliance check monitoring of emissions to air. The substances requested for monitoring at each emissions point are listed below:

Substances to be monitored	**Emission Point Identification**			
	Tack Booth	Base Booth 1	Base Booth 2	Lacquer Booth 3
Particulates	• U	• U	• U	• U

Substances to be monitored	**Emission Point Identification**		
	Lacquer Booth 4	Main Combi Booth	PDI Combi Booth
Particulates	• U	• U	• U

• Denotes the substances to be monitored.

U **Denotes UKAS accreditation is held for monitoring that substance, but does not mean that it has been claimed which will depend on whether the testing could be completed in accordance with the Standard Reference Method.**

Special Requirements: *"Normal Operations."*

1.1 Monitoring Results

Emission Point Reference	Substance to be Monitored		Emission Limit Value	Periodic Monitoring Result	Uncertainty %	Units	Reference Conditions 273 K, 101.3 kPa	Date of Sampling	Start and End Times	Monitoring Method Reference	Accreditation for use of Method	Tick if non-conforming test (see Section 4)	Operating Status
Tack Booth	Particulates	$	10	5.1	11	mg/m³	& wet gas	18/05/10	11:15 – 11:47	BS EN 13284-1	NU	✓	Normal 10 Taxis per day
	Particulates	$	10	0.9	100	mg/m³	& wet gas	18/05/10	11:50 – 12:22	BS EN 13284-1	NU	✓	
Basecoat Booth 1	Particulates	$	10	1.2	100	mg/m³	& wet gas	18/05/10	08:40 – 09:12	BS EN 13284-1	NU	✓	
	Particulates	$	10	1.7	38	mg/m³	& wet gas	18/05/10	09:40 – 10:12	BS EN 13284-1	NU	✓	
Basecoat Booth 2	Particulates	$	10	2.6	28	mg/m³	& wet gas	18/05/10	08:40 – 09:12	BS EN 13284-1	NU	✓	
	Particulates	$	10	3.5	21	mg/m³	& wet gas	18/05/10	09:40 – 10:12	BS EN 13284-1	NU	✓	
Lacquer Booth 3	Particulates	$	10	2.3	27	mg/m³	& wet gas	18/05/10	07:20 – 07:52	BS EN 13284-1	NU	✓	
	Particulates	$	10	1.2	53	mg/m³	& wet gas	18/05/10	07:56 – 08:28	BS EN 13284-1	NU	✓	
Lacquer Booth 4	Particulates	$	10	1.3	40	mg/m³	& wet gas	18/05/10	07:20 – 07:52	BS EN 13284-1	NU	✓	
	Particulates	$	10	2.8	19	mg/m³	& wet gas	18/05/10	07:56 – 08:28	BS EN 13284-1	NU	✓	
Main Combi (Spray)	Particulates	$	10	3.7	10	mg/m³	& wet gas	18/05/10	10:25 – 10:57	BS EN 13284-1	NU	✓	
Main Combi (Bake)	Particulates	$	10	0.9	100	mg/m³	& wet gas	18/05/10	11:30 – 12:02	BS EN 13284-1	NU	✓	
PDI Combi (Spray)	Particulates	$	10	5.9	10	mg/m³	& wet gas	18/05/10	13:10 – 13:42	BS EN 13284-1	NU	✓	
PDI Combi (Spray)	Particulates	$	10	1.0	100	mg/m³	& wet gas	18/05/10	13:45 – 14:17	BS EN 13284-1	NU	✓	

Notes

Emission Limit Value	The emission limit value is that stated in the permit and will be expressed as a concentration or a mass emission.
Periodic Monitoring Result	The result given is expressed in the same terms and units as the emission limit value.
Uncertainty	The uncertainty associated with the quoted result is at the 95% confidence interval. The Uncertainty results **DO NOT** take into account the effect of the sample location limitations.
Reference Conditions	All results are expressed at 273 K and 101.3kPa. The oxygen and moisture corrections are stated.
Monitoring Method Reference	The method stated is in accordance with the Environment Agency Technical Guidance Note M2, or other method approved by the Environment Agency.
Accreditation for use of Method	**The details indicate the accreditation for the use of the complete monitoring method, e.g. MCERTs, UKAS. If use of the method is not accredited " NA" is stated.**
Operating Status	The details indicate the feedstock and the loading rate of the plant during monitoring.
$	Chemical Analysis on sample reagents was performed by an External Laboratory as detailed in Section 3.0
NU	**UKAS Accreditation Held but UKAS Accreditation cannot be claimed for the test as sampling did not comply with the Standard Reference Method (SRM), see section 2.2 & 4.0**
NA	**Method is NOT UKAS Accredited.**

1.2 Operating Information

Emission Point Reference	Date	Process Type	Process Duration	Fuel	Feedstock	Abatement	Load	Comparison of Operator CEMS and Periodic Monitoring Results			
								Substance	CEMS Results	Periodic Monitoring Results	Units
Tack Booth	18/05/10	Batch	Various	n/a	n/a	None	Normal	-	-	-	-
Basecoat Booths	18/05/10	Batch	Various	n/a	n/a	Wet	Normal	-	-	-	-
Lacquer Booths	18/05/10	Batch	Various	n/a	n/a	Wet	Normal	-	-	-	-
Main Combi Booth	18/05/10	Batch	Various	n/a	n/a	Dry	Normal	-	-	-	-
PDI Combi Booth	18/05/10	Batch	Various	n/a	n/a	Dry	Normal	-	-	-	-

Notes:

Process Type	State whether the process is a continuous or batch process.
Process Duration	If a batch process, state the duration, frequency and details of the portion of the batch sampled. If continuous state "NA"
Fuel	If applicable, state the fuel type If not applicable state "NA"
Feedstock	State the feedstock type
Abatement	State the type and whether operational during monitoring. If not applicable state "NA"
Load	State the normal load, throughput or rating of the plant

2.0 INTRODUCTION

Environmental Compliance Ltd (ECL) was commissioned by **London Taxis International Ltd** to undertake an emission monitoring survey at their **Paint Plant in Coventry.** This report presents the findings of the study.

The emissions monitoring survey was carried out by the site sampling team detailed in the table below at the request of **Mr Carl Richardson** in accordance with quotation reference **PC/P618/Q002.**

Site Sampling Team

Names of Site Team	Dates on Site	MCERTS No.	LEVEL	Technical Endorsements
Andy Barnes	18/05/10	MM 03 235	2	TE1, TE2, TE3, TE4
Paul Calland	18/05/10	MM 03 212	2	TE1, TE2, TE3, TE4

Report Reviewer

Name	MCERTS No.	LEVEL	Technical Endorsements
Paul Calland	MM 03 212	2	TE1, TE2, TE3, TE4

Technical Endorsement Key:-

TE1 – **Isokinetic** Particulates, Temperature & Velocity Profiles, Oxygen.
TE2 – **Isokinetic** Extractive Pollutants:- Metals, Dioxin & Furans, PAHs, PCBs, HCL, HF.
TE3 – **Non-Isokinetic** Extractive Pollutants:- Speciated VOCs, HF, HCL, Cyanide.
TE4 – **Continuous Analysers** (Combustion Gases):- VOCs, CO, NOx, SO2.

2.1 Objectives

The objective of the survey was to measure the concentrations of pollutants from the processes / locations as detailed in the Executive Summary. This survey meets the requirements of the site's **PPC Permit Number: PPC 037** where UKAS and MCERTS accreditation has and could be claimed for the testing in the monitoring results table.

2.2 Scope of Work

There were no deviations from the original and agreed emissions monitoring schedule, as detailed in the Executive Summary.

All particulate samples from all locations are described as non-conforming. See section 4.0 for details.

Homogeneity tests have not been completed and are not required for pollutants at any of the sample locations.

3.0 SAMPLING PROTOCOLS / METHODOLOGIES

3.1 Particulates

Testing was carried out using two off unheated manual stack sampling systems in accordance with **BS EN 13284-1 & MID** and In-house technical procedure **ECL/TPD/027.**

Isokinetic particulate sampling is achieved when the velocity of gas entering the sampling nozzle is exactly equal to the velocity of the approaching gas stream within the stack.

During out-stack filtration, a measured volume of sample gas is withdrawn from the stack isokinetically through a sampling nozzle and sampling probe, and then through a pre-weighed filter positioned in a housing.

For in-stack filtration, a measured volume of sample gas is withdrawn from the stack isokinetically through a sampling nozzle and through a pre-weighed filter positioned in a unheated housing inserted into the stack.

Particulate matter is collected on the filter. Following testing the front half of the filter housing, (probe for out-stack filtration) and the sample nozzle are rinsed to remove any particulate matter which, may have impacted on the surfaces during testing.

The filters and rinses are subsequently analysed to determine the amount of particulate matter captured.

RPS Laboratories (RPS) who are situated in **Manchester** carried out the analysis of the samples. **RPS** are UKAS accredited for all analysis conducted. In addition to the survey samples, a field blank is submitted as part of the technical procedure.

3.2 Pressure, Temperature and Velocity

Testing was carried out using a sampling system in accordance with **BS EN 13284-1 & MID** and In-house technical procedure **ECL/TPD/022.**

Temperature was recorded using a thermocouple and digital temperature reader.

Velocity and pressure was recorded using an "L" type pitot and digital manometer, data being recorded in Pascals.

4.0 SAMPLE POINT DESCRIPTIONS

The sample locations that were monitored are detailed below:-

Samples for Particulates from all locations are described as non-conforming tests, due to the fact that swirl was recorded at all locations in excess of the maximum 15 degrees allowed by the SRM

The Uncertainty of the reported concentrations for these pollutant results DO NOT take into account the effect of the sample location limitations.

4.1 Tack Booth

Sampling takes place in a straight section of horizontal ductwork with 50cm diameter. The sample plane is after the fan, 1.0m after a bend and 1.5m before a bend. As such the sampling plane does not meet the positional *recommendations* of BSEN 13284.

Furthermore the sampling plane does not meet the flow *requirements* of the standard, as there are a number of positions on the sampling plane where the angle of gas flow is greater than 15 degrees from the duct axis. There were no alternative positions safely accessible on the test dates.

As sampling could not be carried out in accordance with the Standard Reference Method UKAS accreditation cannot be claimed for the results for Particulates even though UKAS accreditation is held for monitoring.

4.2 Basecoat Booths 1 & 2

Sampling takes place in straight sections of vertical ductwork with 120cm diameter. The sample planes are 1.0m above the fan, only one sampling line is available. As such the sampling planes do not meet the positional *recommendations* of BSEN 13284.

Furthermore the sampling planes do not meet the flow *requirements* of the standard, as there are a number of positions on the sampling planes where the angle of gas flow is greater than 15 degrees from the duct axis and the ratios of highest to lowest pitot readings exceeded 9:1. There were no alternative positions safely accessible on the test dates.

As sampling could not be carried out in accordance with the Standard Reference Method UKAS accreditation cannot be claimed for the results for Particulates even though UKAS accreditation is held for monitoring.

4.3 Lacquer Booths 3 & 4

Sampling takes place in straight sections of vertical ductwork with dimensions of 120 x 120 cm. The sample planes are 150cm above the fan, two sampling lines are available. As such the sampling planes do not meet the positional *recommendations* of BSEN 13284.

Furthermore the sampling planes do not meet the flow *requirements* of the standard, as there are a number of positions on the sampling planes where the angle of gas flow is greater than 15 degrees from the duct axis. and the ratios of highest to lowest pitot readings exceeded 9:1. There were no alternative positions safely accessible on the test dates.

As sampling could not be carried out in accordance with the Standard Reference Method UKAS accreditation cannot be claimed for the results for Particulates even though UKAS accreditation is held for monitoring.

4.4 Main Combi Booth

Sampling takes place in a straight section of vertical ductwork with 80cm diameter. The sample plane is after the fan, 2.0m after a bend and 0.3 m before a bend. As such the sampling plane does not meet the positional *recommendations* of BSEN 13284.

Furthermore the sampling plane does not meet the flow *requirements* of the standard, as there are a number of positions on the sampling plane where the angle of gas flow is greater than 15 degrees from the duct axis. There were no alternative positions safely accessible on the test dates.

Two tests were taken, one during the spraying cycle and one during the bake cycle. The extraction switches off during the bake cycle and as a consequence the bake cycle sample is non isokinetic.

As sampling could not be carried out in accordance with the Standard Reference Method UKAS accreditation cannot be claimed for the results for Particulates even though UKAS accreditation is held for monitoring.

4.5 PDI Combi Booth

Sampling takes place in a straight section of vertical ductwork with 80cm diameter. The sample plane is after the fan, 2.5m above the fan and at least 4m before the exit. As such the sampling plane does meet the positional *recommendations* of BSEN 13284.

However the sampling plane does not meet the flow *requirements* of the standard, as there are a number of positions on the sampling plane where the angle of gas flow is greater than 15 degrees from the duct axis. There were no alternative positions safely accessible on the test dates.

On this occasion no baking was required so both tests were made during spraying.

As sampling could not be carried out in accordance with the Standard Reference Method UKAS accreditation cannot be claimed for the results for Particulates even though UKAS accreditation is held for monitoring.

TABLES

Table 1
Particulate Data Recorded from Paint Shop - Tack Booth

Emission Parameter	Units	Test 1	Test 2	Blank
Stack Diameter	metres	0.50	0.50	...
Area of Sample Plane	m^2	0.196	0.196	...
Stack Temperature	°C	24	24	...
Gas Velocity (at Stack Conditions)	m/sec	8.18	8.18	...
Gas Velocity (Reference Conditions)	m/sec*	7.55	7.55	...
Volumetric Flowrate (Stack Conditions)	m^3/sec	1.61	1.61	...
Volumetric Flowrate (Reference Conditions)	m^3/sec*	1.48	1.48	...
Sample Date	...	18/05/2010	18/05/2010	...
Sample Period	...	11:15 - 11:47	11:50 - 12:22	...
Sample Volume (as measured)	m^3	0.64	0.68	...
Sample Volume (reference Conditions)	m^3*	0.58	0.60	0.60
Isokinetic Sampling Rate	%	102.27	105.95	...
Sample Reference (ECL ID)	ECL/10/	2034 & 2035	2036 & 2037	2062 & 2063
Mass of Particulate Matter Collected	mg	2.94	0.54	0.54
Concentration of Particulate Matter	mg/m^3*	**5.08**	**0.90**	0.90
Emission Rate of Particulate Matter	g/hr	27.14	4.81	...
Expanded Uncertainty (% Relative)	%	11	100	...
Emission Limit Value (ELV)	mg/m^3*	10	10	...
Blank Concentration as Percentage of ELV	%	...	...	9.01

*Reference Conditions (273K, 101.3kPa, Wet Gas)

Table 2
Particulate Data Recorded from Paint Shop – Base Booth 1

Emission Parameter	Units	Test 1	Test 2	Blank
Stack Diameter	metres	1.20	1.20	...
Area of Sample Plane	m^2	1.131	1.131	...
Stack Temperature	°C	23	23	...
Gas Velocity (at Stack Conditions)	m/sec	8.67	8.67	...
Gas Velocity (Reference Conditions)	m/sec*	8.12	8.12	...
Volumetric Flowrate (Stack Conditions)	m^3/sec	9.80	9.80	...
Volumetric Flowrate (Reference Conditions)	m^3/sec*	9.19	9.19	...
Sample Date	...	18/05/2010	18/05/2010	...
Sample Period	...	08:40 - 09:12	09:40 - 10:12	...
Sample Volume (as measured)	m^3	0.51	0.51	...
Sample Volume (reference Conditions)	m^3*	0.47	0.46	0.46
Isokinetic Sampling Rate	%	105.91	104.72	...
Sample Reference (ECL ID)	ECL/10/	2038 & 2039	2040 & 2041	2062 & 2063
Mass of Particulate Matter Collected	mg	0.54	0.80	0.54
Concentration of Particulate Matter	mg/m^3*	**1.15**	**1.73**	1.16
Emission Rate of Particulate Matter	g/hr	38.09	57.09	...
Expanded Uncertainty (% Relative)	%	100	38	...
Emission Limit Value (ELV)	mg/m^3*	10	10	...
Blank Concentration as Percentage of ELV	%	...	...	11.65

*Reference Conditions (273K, 101.3kPa, Wet Gas)

Table 3
Particulate Data Recorded from Paint Shop – Base Booth 2

Emission Parameter	Units	Test 1	Test 2	Blank
Stack Diameter	metres	1.20	1.20	...
Area of Sample Plane	m^2	1.131	1.131	...
Stack Temperature	°C	23	23	...
Gas Velocity (at Stack Conditions)	m/sec	7.54	7.54	...
Gas Velocity (Reference Conditions)	m/sec*	7.02	7.02	...
Volumetric Flowrate (Stack Conditions)	m^3/sec	8.52	8.52	...
Volumetric Flowrate (Reference Conditions)	m^3/sec*	7.94	7.94	...
Sample Date	...	18/05/2010	18/05/2010	...
Sample Period	...	08:40 - 09:12	09:40 - 10:12	...
Sample Volume (as measured)	m^3	0.46	0.46	...
Sample Volume (reference Conditions)	m^3*	0.42	0.41	0.41
Isokinetic Sampling Rate	%	108.70	107.80	...
Sample Reference (ECL ID)	ECL/10/	2042 & 2043	2044 & 2045	2062 & 2063
Mass of Particulate Matter Collected	mg	1.09	1.44	0.54
Concentration of Particulate Matter	mg/m^3*	**2.62**	**3.49**	1.31
Emission Rate of Particulate Matter	g/hr	74.97	99.85	...
Expanded Uncertainty (% Relative)	%	28	21	...
Emission Limit Value (ELV)	mg/m^3*	10	10	...
Blank Concentration as Percentage of ELV	%	...	...	13.10

*Reference Conditions (273K, 101.3kPa, Wet Gas)

Table 4
Particulate Data Recorded from Paint Shop – Lacquer Booth 3

Emission Parameter	Units	Test 1	Test 2	Blank
Duct Length	metres	1.20	1.20	...
Duct Width	metres	1.20	1.20	...
Area of Sample Plane	m^2	1.440	1.440	...
Stack Temperature	°C	23	23	...
Gas Velocity (at Stack Conditions)	m/sec	8.59	8.59	...
Gas Velocity (Reference Conditions)	m/sec*	7.97	7.97	...
Volumetric Flowrate (Stack Conditions)	m^3/sec	12.37	12.37	...
Volumetric Flowrate (Reference Conditions)	m^3/sec*	11.47	11.47	...
Sample Date	...	18/05/2010	18/05/2010	...
Sample Period	...	07:20 - 07:52	07:56 - 08:28	...
Sample Volume (as measured)	m^3	0.52	0.52	...
Sample Volume (reference Conditions)	m^3*	0.49	0.48	0.48
Isokinetic Sampling Rate	%	110.00	107.80	...
Sample Reference (ECL ID)	ECL/10/	2046 & 2047	2048 & 2049	2062 & 2063
Mass of Particulate Matter Collected	mg	1.15	0.57	0.54
Concentration of Particulate Matter	mg/m^3*	**2.34**	**1.19**	1.12
Emission Rate of Particulate Matter	g/hr	96.82	48.98	...
Expanded Uncertainty (% Relative)	%	27	53	...
Emission Limit Value (ELV)	mg/m^3*	10	10	...
Blank Concentration as Percentage of ELV	%	...	...	11.24

*Reference Conditions (273K, 101.3kPa, Wet Gas)

Table 5
Particulate Data Recorded from Paint Shop – Lacquer Booth 4

Emission Parameter	Units	Test 1	Test 2	Blank
Duct Length	metres	1.20	1.20	...
Duct Width	metres	1.20	1.20	...
Area of Sample Plane	m^2	1.440	1.440	...
Stack Temperature	°C	23	23	...
Gas Velocity (at Stack Conditions)	m/sec	10.55	10.55	...
Gas Velocity (Reference Conditions)	m/sec*	9.78	9.78	...
Volumetric Flowrate (Stack Conditions)	m^3/sec	15.19	15.19	...
Volumetric Flowrate (Reference Conditions)	m^3/sec*	14.08	14.08	...
Sample Date	...	18/05/2010	18/05/2010	...
Sample Period	...	07:20 - 07:52	07:56 - 08:28	...
Sample Volume (as measured)	m^3	0.63	0.63	...
Sample Volume (reference Conditions)	m^3*	0.59	0.57	0.57
Isokinetic Sampling Rate	%	108.23	105.72	...
Sample Reference (ECL ID)	ECL/10/	2050 & 2051	2052 & 2053	2062 & 2063
Mass of Particulate Matter Collected	mg	0.77	1.60	0.54
Concentration of Particulate Matter	mg/m^3*	**1.31**	**2.79**	0.94
Emission Rate of Particulate Matter	g/hr	66.59	141.66	...
Expanded Uncertainty (% Relative)	%	40	19	...
Emission Limit Value (ELV)	mg/m^3*	10	10	...
Blank Concentration as Percentage of ELV	%	...	...	9.43

*Reference Conditions (273K, 101.3kPa, Wet Gas)

Table 6
Particulate Data Recorded from Paint Shop – Main Combi Booth

Emission Parameter	Units	Test 1	Test 2	Blank
Stack Diameter	metres	0.80	0.80	...
Area of Sample Plane	m^2	0.503	0.503	...
Stack Temperature	°C	23	Fan Off During Bake – Non Isokinetic Sample	...
Gas Velocity (at Stack Conditions)	m/sec	8.47		...
Gas Velocity (Reference Conditions)	m/sec*	7.86		...
Volumetric Flowrate (Stack Conditions)	m^3/sec	4.26		...
Volumetric Flowrate (Reference Conditions)	m^3/sec*	3.95		...
Sample Date	...	18/05/2010	18/05/2010	...
Sample Period	...	10:25 - 10:57	11:30 - 12:02	...
Sample Volume (as measured)	m^3	0.68	0.67	...
Sample Volume (reference Conditions)	m^3*	0.61	0.60	0.60
Isokinetic Sampling Rate	%	102.93	n/a	
Sample Reference (ECL ID)	ECL/10/	2054 & 2055	2056 & 2057	2062 & 2063
Mass of Particulate Matter Collected	mg	2.26	0.54	0.54
Concentration of Particulate Matter	mg/m^3*	**3.73**	**0.91**	0.91
Emission Rate of Particulate Matter	g/hr	53.06	n/a	...
Expanded Uncertainty (% Relative)	%	14	100	...
Emission Limit Value (ELV)	mg/m^3*	10	10	...
Blank Concentration as Percentage of ELV	%	...	...	9.07

*Reference Conditions (273K, 101.3kPa, Wet Gas)

Table 7
Particulate Data Recorded from Paint Shop – PDI Combi Booth

Emission Parameter	Units	Test 1	Test 2	Blank
Stack Diameter	metres	0.80	0.80	...
Area of Sample Plane	m^2	0.503	0.503	...
Stack Temperature	°C	25	25	...
Gas Velocity (at Stack Conditions)	m/sec	10.44	10.44	...
Gas Velocity (Reference Conditions)	m/sec*	9.62	9.62	...
Volumetric Flowrate (Stack Conditions)	m^3/sec	5.25	5.25	...
Volumetric Flowrate (Reference Conditions)	m^3/sec*	4.83	4.83	...
Sample Date	...	18/05/2010	18/05/2010	...
Sample Period	...	13:10 - 13:42	13:45 - 14:17	...
Sample Volume (as measured)	m^3	0.61	0.61	...
Sample Volume (reference Conditions)	m^3*	0.55	0.55	0.55
Isokinetic Sampling Rate	%	103.35	102.76	...
Sample Reference (ECL ID)	ECL/10/	2058 & 2059	2060 & 2061	2062 & 2063
Mass of Particulate Matter Collected	mg	3.24	0.54	0.54
Concentration of Particulate Matter	mg/m^3*	**5.88**	**0.99**	0.99
Emission Rate of Particulate Matter	g/hr	102.30	17.15	...
Expanded Uncertainty (% Relative)	%	10	100	...
Emission Limit Value (ELV)	mg/m^3*	10	10	...
Blank Concentration as Percentage of ELV	%	...	...	9.85

*Reference Conditions (273K, 101.3kPa, Wet Gas)

VELOCITY TRAVERSE PROFILES

Environmental Compliance Limited	Traverse Data Profoma	Date of Measurement	18/05/2010

Company	LTI	Stack Diameter (mm)	500	Pitot tube coefficient	1
Site	Coventry	Port Length (mm)		Pitot ID	489/487
Location	Paint Shop	Duct Length (mm) A		Thermocouple ID	466
Stack	Tack Booth	Duct width (mm) B		Thermocouple Reader ID	358
Job No	P618	Barometric Pressure. (mb)	1018	Barometer Id	205
Operators	ABI PC	Static Pressure. (mm H_2O)	0.5	Manometer ID	504

	Distance to Point (mm)	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference
	25	A	24.0	45.0	25	B	24.0	25.0	25
	75	A	24.0	45.0	25	B	24.0	30.0	25
	125	A	24.0	45.0	25	B	24.0	30.0	25
	175	A	24.0	40.0	20	B	24.0	35.0	20
	225	A	24.0	35.0	20	B	24.0	35.0	20
	275	A	24.0	30.0	20	B	24.0	35.0	20
	325	A	24.0	35.0	25	B	24.0	40.0	25
	375	A	24.0	40.0	25	B	24.0	45.0	25
	425	A	24.0	45.0	25	B	24.0	55.0	25
	475	A	24.0	46.0	25	B	24.0	65.0	25
Total			240				240		
Max			24	45.0			24	65.0	
Min			24	30.0			24	25.0	
Average			24.0	40.5			24.00	39.50	

Average temp (K)	297

Suitability of Sampling Position	Actual Stack Conditons
Permitted highest:lowest flow pressure ratio =9:1	2.6:1
Average deviation of flow from axis <15°	Fail
X-sectional area for stacks= πr^2	0.20 m^2
X-sectional area for ducts = L x B	0.000 m^2
Suitability of Position for Sampling	NO

Stack Moisture	0.5	%
Measured Oxygen	20.9	%
Measured Carbon Dioxide	0.00	%
Dry Gas Molecular Weight	28.836	g/g mole

Gas Velocity (as Measured)	8.16	m/sec
Gas Velocity (Reference Conditions)	7.54	m/sec*
Volumetric Flowrate (as Measured)	1.60	m^3/sec
Volumetric Flowrate (Reference Conditions)	1.48	m^3/sec*

*Reference Conditions: 273K, 101.3kPa, Wet Gas

Diagram of Cross Section of Stack/Duct

See text in report

Comments

Swirl Exceeds 15 degrees across entire duct. Ports too small to allow in stack sampling.

	Type	Distance m
Nearest downstream disturbance	Bend	1.5
Nearest upstream disturbance	Bend	1

Disturbances are classed as bends, fans or diameter variations

Environmental Compliance Limited	Traverse Data Profoma	Date of Measurement	18/05/2010

Company	LTI	Stack Diameter (mm)	1200	Pitot tube coefficient		1
Site	Coventry	Port Length (mm)		Pitot ID		489/487
Location	Paint Shop	Duct Length (mm) A		Thermocouple ID		466
Stack	Base Booth 1	Duct width (mm) B		Thermocouple Reader ID		358
Job No	P618	Barometric Pressure. (mb)	1018	Barometer Id		205
Operators	ABI PC	Static Pressure. (mm H_20)	120	Manometer ID		504

	Distance to Point (mm)	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference
	60	A	23.0	150.0	45				
	80	A	23.0	100.0	35				
	300	A	23.0	75.0	25				
	420	A	23.0	60.0	20				
	540	A	23.0	30.0	20				
	660	A	23.0	10.0	20				
	780	A	23.0	25.0	25				
	900	A	23.0	50.0	35				
	1020	A	23.0	55.0	40				
	1140	A	23.0	75.0	45				
Total			230				0		
Max			23	150.0			0	0.0	
Min			23	10.0			0	0.0	
Average			23.0	62.0					

Average temp (K)	296

Suitability of Sampling Position	Actual Stack Conditons
Permitted highest:lowest flow pressure ratio =9:1	
Average deviation of flow from axis <15°	Fail
X-sectional area for stacks= πr^2	1.13 m^2
X-sectional area for ducts = L x B	0.000 m^2
Suitability of Position for Sampling	NO

Stack Moisture	0.5	%
Measured Oxygen	20.9	%
Measured Carbon Dioxide	0.00	%
Dry Gas Molecular Weight	28.836	g/g mole

Gas Velocity (as Measured)	9.63	m/sec
Gas Velocity (Reference Conditions)	9.03	m/sec*
Volumetric Flowrate (as Measured)	10.89	m^3/sec
Volumetric Flowrate (Reference Conditions)	10.21	m^3/sec*

*Reference Conditions: 273K, 101.3kPa, Wet Gas

Diagram of Cross Section of Stack/Duct

See text in report

Comments

Swirl exceeds 15 degrees, pitot ratio exceeds 9:1. 1 line only. Port too small for instack sampling.

	Type	Distance m
Nearest downstream disturbance	Fan	1
Nearest upstream disturbance	Roof	1

Disturbances are classed as bends, fans or diameter variations

Environmental Compliance Limited	Traverse Data Profoma	Date of Measurement	18/05/2010

Company	LTI	Stack Diameter (mm)	1200	Pitot tube coefficient	1
Site	Coventry	Port Length (mm)		Pitot ID	489/487
Location	Paint Shop	Duct Length (mm) A		Thermocouple ID	456
Stack	Base Booth 2	Duct width (mm) B		Thermocouple Reader ID	358
Job No	P618	Barometric Pressure. (mb)	1018	Barometer Id	205
Operators	ABI PC	Static Pressure. (mm H_2O)	52	Manometer ID	504

	Distance to Point (mm)	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference
	60	A	23.0	96.0	45				
	80	A	23.0	80.0	35				
	300	A	23.0	65.0	25				
	420	A	23.0	40.0	20				
	540	A	23.0	25.0	20				
	660	A	23.0	10.0	20				
	780	A	23.0	15.0	25				
	900	A	23.0	25.0	35				
	1020	A	23.0	40.0	40				
	1140	A	23.0	75.0	45				
Total			230				0		
Max			23	96.0			0	0.0	
Min			23	10.0			0	0.0	
Average			23.0	47.1					

Average temp (K)	296

Suitability of Sampling Position	Actual Stack Conditons
Permitted highest:lowest flow pressure ratio =9:1	
Average deviation of flow from axis <15°	Fail
X-sectional area for stacks= πr^2	1.13 m^2
X-sectional area for ducts = L x B	0.000 m^2
Suitability of Position for Sampling	NO

Stack Moisture	0.5	%
Measured Oxygen	20.9	%
Measured Carbon Dioxide	0.00	%
Dry Gas Molecular Weight	28.836	g/g mole

Gas Velocity (as Measured)	8.42	m/sec
Gas Velocity (Reference Conditions)	7.84	m/sec*
Volumetric Flowrate (as Measured)	9.52	m^3/sec
Volumetric Flowrate (Reference Conditions)	8.87	m^3/sec*

*Reference Conditions: 273K, 101.3kPa, Wet Gas

Diagram of Cross Section of Stack/Duct

See text in report

Comments

Swirl exceeds 15 degrees, pitot ratio exceeds 9:1. 1 line only. Port too small for instack sampling.

	Type	Distance m
Nearest downstream disturbance	Fan	1
Nearest upstream disturbance	Roof	1

Disturbances are classed as bends, fans or diameter variations

Environmental Compliance Limited	Traverse Data Proforma	Date of Measurement	18/05/2010

Company	LTI	Stack Diameter (mm)		Pitot tube coefficient	1
Site	Coventry	Port Length (mm)	90	Pitot ID	469/ 467
Location	Paint Shop	Duct Length (mm) A	1200	Thermocouple ID	466
Stack	Lacquer Booth 3	Duct width (mm) B	1200	Thermocouple Reader ID	358
Job No	P618	Barometric Pressure. (mb)	1018	Barometer Id	205
Operators	AB/ PC	Static Pressure. (mm H_20)	4.5	Manometer ID	504

	Distance to Point (mm)	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference
	60	A	23.0	100.0	15	B	23.0	100.0	15
	80	A	23.0	75.0	20	B	23.0	75.0	20
	300	A	23.0	70.0	25	B	23.0	70.0	25
	420	A	23.0	45.0	25	B	23.0	45.0	25
	540	A	23.0	25.0	30	B	23.0	20.0	30
	660	A	23.0	10.0	30	B	23.0	15.0	30
	780	A	23.0	20.0	25	B	23.0	20.0	25
	900	A	23.0	30.0	25	B	23.0	30.0	25
	1020	A	23.0	45.0	20	B	23.0	45.0	20
	1140	A	23.0	75.0	15	B	23.0	75.0	15
Total			230				230		
Max			23	100.0			23	100.0	
Min			23	10.0			23	15.0	
Average			23.0	49.5			23.00	49.50	

Average temp (K)	296

	Actual Stack Conditons
Suitability of Sampling Position	
Permitted highest:lowest flow pressure ratio =9:1	Fail
Average deviation of flow from axis <15°	0.00 m^2
X-sectional area for stacks= πr^2	1.440 m^2
X-sectional area for ducts = L x B	NO
Suitability of Position for Sampling	

Stack Moisture	0.5	%
Measured Oxygen	20.9	%
Measured Carbon Dioxide	0.00	%
Dry Gas Molecular Weight	28.836	g/g mole

Gas Velocity (as Measured)	8.72	m/sec
Gas Velocity (Reference Conditions)	8.09	m/sec*
Volumetric Flowrate (as Measured)	12.56	m^3/sec
Volumetric Flowrate (Reference Conditions)	11.64	m^3/sec*

*Reference Conditions: 273K, 101.3kPa, Wet Gas

Diagram of Cross Section of Stack/Duct

See text in report

Comments

Swirl exceeds 15 degrees, pitot ratio exceeds 9:1. 1 line only. Port too small for instack sampling.

	Type	Distance m
Nearest downstream disturbance	Fan	1.5
Nearest upstream disturbance	Roof	1
Disturbances are classed as bends, fans or diameter variations		

Environmental Compliance Limited	Traverse Data Profoma	Date of Measurement	18/05/2010

Company	LTI	Stack Diameter (mm)		Pitot tube coefficient	1
Site	Coventry	Port Length (mm)	90	Pitot ID	489/487
Location	Paint Shop	Duct Length (mm) A	1200	Thermocouple ID	466
Stack	Lacquer Booth 4	Duct width (mm) B	1200	Thermocouple Reader ID	358
Job No	P618	Barometric Pressure. (mb)	1018	Barometer Id	205
Operators	AB/PC	Static Pressure. (mm H_2O)	4.2	Manometer ID	504

	Distance to Point (mm)	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference
	60	A	23.0	150.0	15	B	23.0	140.0	15
	80	A	23.0	130.0	20	B	23.0	120.0	20
	300	A	23.0	100.0	25	B	23.0	110.0	25
	420	A	23.0	85.0	25	B	23.0	90.0	25
	540	A	23.0	75.0	30	B	23.0	70.0	30
	660	A	23.0	55.0	30	B	23.0	60.0	30
	780	A	23.0	55.0	25	B	23.0	40.0	25
	900	A	23.0	45.0	25	B	23.0	30.0	25
	1020	A	23.0	35.0	20	B	23.0	20.0	20
	1140	A	23.0	25.0	15	B	23.0	15.0	15
Total			230				230		
Max			23	150.0			23	140.0	
Min			23	25.0			23	15.0	
Average			23.0	75.5			23.00	69.50	

Average temp (K)	296

	Actual Stack Conditons
Suitability of Sampling Position	
Permitted highest:lowest flow pressure ratio =9:1	Fail
Average deviation of flow from axis <15°	0.00 m^2
X-sectional area for stacks= πr^2	1.440 m^2
X-sectional area for ducts = L x B	NO
Suitability of Position for Sampling	

Stack Moisture	0.5	%
Measured Oxygen	20.9	%
Measured Carbon Dioxide	0.00	%
Dry Gas Molecular Weight	28.836	g/g mole

Gas Velocity (as Measured)	10.56	m/sec
Gas Velocity (Reference Conditions)	9.79	m/sec*
Volumetric Flowrate (as Measured)	15.21	m^3/sec
Volumetric Flowrate (Reference Conditions)	14.10	m^3/sec*

*Reference Conditions: 273K, 101.3kPa, Wet Gas

Diagram of Cross Section of Stack/Duct

See text in report

Comments

Swirl exceeds 15 degrees, pitot ratio exceeds 9:1. 1 line only. Port too small for instack sampling.

	Type	Distance m
Nearest downstream disturbance	Fan	1.5
Nearest upstream disturbance	Roof	1

Disturbances are classed as bends, fans or diameter variations

Environmental Compliance Limited	Traverse Data Profoma	Date of Measurement	18/05/2010

Company	LTI	Stack Diameter (mm)	800	Pitot tube coefficient	1
Site	Coventry	Port Length (mm)	90	Pitot ID	489/487
Location	Paint Shop	Duct Length (mm) A		Thermocouple ID	466
Stack	Main Combi	Duct width (mm) B		Thermocouple Reader ID	358
Job No	P618	Barometric Pressure. (mb)	1018	Barometer Id	205
Operators	AB/ PC	Static Pressure. (mm H_2O)	4	Manometer ID	504

	Distance to Point (mm)	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference
	54	A	24.0	60.0	15	B	24.0	60.0	15
	120	A	24.0	58.0	15	B	24.0	58.0	15
	200	A	24.0	45.0	20	B	24.0	45.0	20
	280	A	24.0	30.0	20	B	24.0	30.0	20
	360	A	24.0	20.0	25	B	24.0	20.0	25
	440	A	24.0	25.0	25	B	24.0	25.0	25
	520	A	24.0	30.0	20	B	24.0	30.0	20
	600	A	24.0	48.0	20	B	24.0	48.0	20
	680	A	24.0	58.0	15	B	24.0	58.0	15
	746	A	24.0	65.0	15	B	24.0	65.0	15
Total			240				240		
Max			24	65.0			24	65.0	
Min			24	20.0			24	20.0	
Average			24.0	43.9			24.00	43.90	

Average temp (K)	297

Suitability of Sampling Position	Actual Stack Conditons
Permitted highest:lowest flow pressure ratio =9:1	3.25:1
Average deviation of flow from axis <15°	Fail
X-sectional area for stacks= πr^2	0.50 m^2
X-sectional area for ducts = L x B	0.000 m^2
Suitability of Position for Sampling	NO

Stack Moisture	0.5	%
Measured Oxygen	20.9	%
Measured Carbon Dioxide	0.00	%
Dry Gas Molecular Weight	28.836	g/g mole

Gas Velocity (as Measured)	6.45	m/sec
Gas Velocity (Reference Conditions)	7.81	m/sec*
Volumetric Flowrate (as Measured)	4.25	m^3/sec
Volumetric Flowrate (Reference Conditions)	3.92	m^3/sec*

*Reference Conditions: 273K, 101.3kPa, Wet Gas

Diagram of Cross Section of Stack/Duct

See text in report

Comments

Swirl exceeds 15 degrees

	Type	Distance m
Nearest downstream disturbance	Bend	2
Nearest upstream disturbance	Bend	0.5

Disturbances are classed as bends, fans or diameter variations

Environmental Compliance Limited	Traverse Data Profoma	Date of Measurement	18/05/2010

Company	LTI	Stack Diameter (mm)	800	Pitot tube coefficient	1
Site	Coventry	Port Length (mm)		Pitot ID	489/ 487
Location	Paint Shop	Duct Length (mm) A		Thermocouple ID	466
Stack	PDI Combi	Duct width (mm) B		Thermocouple Reader ID	358
Job No	P618	Barometric Pressure. (mb)	1018	Barometer Id	205
Operators	AB/ PC	Static Pressure. (mm H_2O)	5	Manometer ID	504

	Distance to Point (mm)	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference	Port	Temp. (°C)	(ΔP) (Pa)	Swirl Test ° From Reference
	54	A	25.0	40.0	25	B	25.0	45.0	25
	120	A	25.0	55.0	25	B	25.0	55.0	25
	200	A	25.0	65.0	20	B	25.0	60.0	20
	280	A	25.0	75.0	20	B	25.0	75.0	20
	360	A	25.0	85.0	20	B	25.0	80.0	20
	440	A	25.0	85.0	20	B	25.0	85.0	20
	520	A	25.0	75.0	20	B	25.0	75.0	20
	600	A	25.0	65.0	25	B	25.0	60.0	25
	680	A	25.0	55.0	25	B	25.0	55.0	25
	746	A	25.0	40.0	25	B	25.0	50.0	25
Total			250				250		
Max			25	65.0			25	85.0	
Min			25	40.0			25	45.0	
Average			25.0	64.0			25.00	64.00	

Average temp (K)	298

Suitability of Sampling Position	Actual Stack Conditons
Permitted highest:lowest flow pressure ratio =9:1	2.13:1
Average deviation of flow from axis <15°	Fail
X-sectional area for stacks= πr^2	0.50 m^2
X-sectional area for ducts = L x B	0.000 m^2
Suitability of Position for Sampling	NO

Stack Moisture	0.6	%
Measured Oxygen	20.9	%
Measured Carbon Dioxide	0.00	%
Dry Gas Molecular Weight	28.836	g/g mole

Gas Velocity (as Measured)	10.33	m/sec
Gas Velocity (Reference Conditions)	9.52	m/sec*
Volumetric Flowrate (as Measured)	5.19	m^3/sec
Volumetric Flowrate (Reference Conditions)	4.78	m^3/sec*

*Reference Conditions: 273K, 101.3kPa, Wet Gas

Diagram of Cross Section of Stack/Duct

See text in report

Comments

Swirl exceeds 15 degrees & holes too small for in stack sampling

	Type	Distance m
Nearest downstream disturbance	Bend	2.5
Nearest upstream disturbance	Exit	4

Disturbances are classed as bends, fans or diameter variations

EQUIPMENT IDs

Environmental Compliance Unit G1, Main Avenue, Treforest Ind Est. Pontypridd, CF37 5YL	SITE SPECIFIC PROTOCOL	JOB NO: P618 / Q001 V1 Date: 06/05/2010

10. EQUIPMENT USED

(To be completed ON SITE IN FULL, circle equipment id used where necessary or delete not used)

Equipment	Equip. Type	ID No:	ID No:	ID No:	ID No:	ID No:	ID No:	ID No:	ID No:	ID No:	ID No:
MST console/pump	E001	U001	U002	U003	U004	U005	U006	U007	U008	U009	
MST Nozzle set		021	402	321	335	403	274	219	646	647	648
MST "S" Type Pitot											
MST Probe											
MST Hot Box		010	133	134	192	198	322	336	346	390	400
MST Impinger Arm		019	152	153	154	155	156	323	337	391	401
		656	657	658	659	660					
Barometer		204	(205)	351	352	626	627	628	629		
Site Balance		008	088	275	368	597	661	662			
Site Check weights		190	191	209	210	276	277	457	458	459	460
		598	599								
Horiba	E002	096	271	511							
Heated Probe		631	632	633							
Chiller		188	270	512	663	664					
Sonimix		107	278	513							
Heated Line		097	273	514							
FID	E003	211	269	301	304	516					
Heated Line		355	432	212	268	517					
Testo	E004	057	350	499	500						
FTIR	E005	566									
Heated Probe		572									
Heated Line		567									
Stacknite	E006	366	367								
"L" Type Pitot		489	487								
Digital Manometer		356	504								
Stack Thermocouple		466	388								
Thermocouple Reader			358								
Nozzle Set		525	524	520	536	+ Nos JKA5					

Quantity of Ice Required / Used for Survey	ZERO	Bags (2kg bags)