STADCO Coventry

Determination of Particulate & Gaseous Emissions
On the ED Incinerator
Holbrook Lane, Coventry
CV6 4AW

14 January 2008

Prepared by: **CES Environmental Instruments Ltd**
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Report prepared by [redacted]
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MCERTS Reg No. MM 02 100

Report authorised by [redacted]
R.M. Allen
MCERTS Reg No. MM 02 009

UKAS TESTING
2338

mCERTS

Contents

Part 1: Executive Summary

Operator Company: -	STADCO Coventry
Address: -	Holbrook Lane, Coventry, CV6 4AW
Plant: -	ED Incinerator
Permit Number: -	PPC/058
Monitoring Date: -	14 January 2008
Monitoring Company: -	CES Environmental Instruments Ltd UKAS Accreditation Number: 2338
Address: -	Bretby Business Park, Ashby Road, Stanhope, Bretby Burton on Trent, DE15 0YZ
Analytical Company: -	CES Environmental Instruments Ltd UKAS Accreditation Number: 2338
Address: -	Bretby Business Park, Ashby Road, Stanhope, Bretby Burton on Trent, DE15 0YZ
Report Number: -	EI/4542
Report Date: -	12 February 2007

Monitoring Objective
To monitor quantify particulate and gaseous emissions to atmosphere from the ED Incinerator located at STADCO, Coventry.

Test Team
D. Slack (MCERTS Level 2, TE1, TE4 MM 02 100)
M. Rodgers (MCERTS Level 2, TE1 MM 04 531)
A. Orme (MCERTS Level 1 MM 04 530)
D. Littlewood (MCERTS Level 1, TE1 MM 06 772)

Report authorised by [redacted]
R.M. Allen
MCERTS Reg No. MM 02 009

Results
Date of Sampling: 14 January 2008

Location	Pollutant	Start and End Times	Test No.	Concentration mg/Nm³	Mean Concentration mg/Nm³	Uncertainty (±) mg/Nm³	Emission Rate kg/hr	Mean Emission Rate kg/hr
ED Incinerator	Particulate	11:10-12:10	1	1.2	0.8	0.2	0.001	0.001
ED Incinerator	Particulate	12:14-13:18	2	0.3 **			0.000	
ED Incinerator	Particulate	-	Blank	0.0	0.0	0.0	-	-
ED Incinerator	Oxides of Nitrogen	11:36-13:35	1	4.7	4.7	0.9	-	-
ED Incinerator	Carbon Monoxide	11:36-13:35	1	27.5	27.5	2.8	-	-
ED Incinerator	Volatile Organic Compounds	11:36-13:35	1	32.1	32.1	9.6	-	-

Results Correct to

Temperature		Pressure		Oxygen		Gas	
°C/K	0/273	mbar/kPa	1013/101.3	%	-	Wet/Dry	Dry

All tests UKAS Accredited to BS EN ISO / IEC 17025 and MCERTS except where * shown

** Indicates where a value less than the limit of detection of the weighing procedure (0.5mg) has been reported, the value lies between the detection limit and zero. A value of half the limit of detection (0.5mg) has been used to calculate the concentration.

1. Introduction

STADCO placed a contract with CES Environmental Instruments Ltd to monitor and quantify the gaseous emissions emitted to atmosphere from the ED Incinerator. The test work was undertaken on 14 January 2008 by CES Environmental Instruments Ltd Engineers. This report described the work carried out and the results obtained.

2. Plant and Process Details and Authorisation Limits

2.1 ED Incinerator

The Contrapol incinerator installed by Stadco Coventry (Mayflower Vehicle Systems) has reached the end of its economic life. Heat for the process is derived via two Nu-Way burners, FMP15 (6OOKW) and FMP 25 (900KW) at a process temperature of 168 to 172 degrees centigrade. At present exhaust gases pass through the incinerator and are exhausted to atmosphere via the existing incinerator stack. The paint media has been upgraded to PPG'S next generation (6) of Powercron 6200. For the duration of the test the plant operated under normal working conditions with a cycle time of one load being dipped every 8 minutes

2.2 Authorisation Limits

The authorisation limits as set out under Coventry City Council, Authorisation Number PPC/058.

Oxides of Nitrogen	100mg/m³	Carbon Monoxide	100mg/m³
Volatile Organic Compounds	None at present		

3. Sampling Location

Orientation	Dimensions	Cross Sectional Area	Sample Ports Available/Used	Sampling Positions Per Plane	Standard
Vertical	Dia 200mm	0.031m²	1/2	4	BS EN 13284-1

Comments:
Sample ports: 1 off 4" BSP socket
Sample times are calculated from the total sample time equally divided by the no. of sample positions per plane. Sample time per position must be greater than 3mins.
Pitot Traverse
Along lines A & B at positions consistent with BS 13284-1 these positions are:
6.7%, 25.0%, 75.0%, 93.3%
(10 point traverse if required 2.6%, 8.2%, 14.6%, 22.6%, 34.2%, 65.8%, 77.4%, 85.4%, 91.8%, 97.4%)
Sample Positions
Along lines A & B at as many of the positions required within the standard method as can be achieved given the clearance limitations behind each socket. BS 13284-1 requires sampling at 8 points (4 on each of two lines) these positions are:
6.7%, 25.0%, 75.0%, 93.3%

	Yes	No
Does the sample plane comply upstream?		✓
Does the sample plane comply downstream?		✓
Are the appropriate sample ports fitted?		✓
Does the velocity air temperature profile comply?	✓	
Minimum platform area >5m²	✓	

N.B. Access only available on 1 of new ports. Have been fitted to low for second port access.
*BS EN13284-1:2001 has a general requirement that the sampling plane shall be in a straight section of duct at least 5 hydraulic diameters downstream and 2 hydraulic diameters upstream of any bend or obstruction which could produce turbulent flow.

4. Sampling Methods

Pollutant	Method	CES Procedure	Equipment	Uncertainty (±)	LOD	Accreditation	ED Incinerator
Particulate	BS EN 13284-1	WI4/1	C193	30%	0.5mg	UKAS, MCERTS	✓
Oxides of Nitrogen	BS ISO 10849	WI4/18	C190	20%	1ppm	UKAS, MCERTS	✓
Carbon Monoxide	BS IO 12039	WI4/19	C190	10%	1ppm	UKAS, MCERTS	✓
VOCs	BS EN 12619	WI4/28	C232	30%	0.1ppm	UKAS, MCERTS	✓

Sampling Equipment: Gravimat: CES Reference C193
Horiba PG-250: CES Reference C190
FID: CES Reference C232

5. Sample Analysis

Determinand	Method	Laboratory	Date of Analysis	UKAS Accredited
Particulate	Gravimetric	CESEI	15/01/08	Y
Oxides of Nitrogen	Chemiluminescence	CESEI	15/01/08	Y
Carbon Monoxide	NDIR	CESEI	15/01/08	Y
Volatile Organic Compounds	Signal FID	CESEI	15/01/08	Y

6. Summary of Results

Location	Pollutant	Start and End Times	Test No.	Concentration mg/Nm³	Mean Concentration mg/Nm³	Uncertainty (±) mg/Nm³	Emission Rate kg/hr	Mean Emission Rate kg/hr
ED Incinerator	Particulate	11:10-12:10	1	1.2	0.8	0.2	0.001	0.001
ED Incinerator	Particulate	12:14-13:18	2	0.3 **			0.000	
ED Incinerator	Particulate	-	Blank	0.0	0.0	0.0	-	-
ED Incinerator	Oxides of Nitrogen	11:36-13:35	1	4.7	4.7	0.9	-	-
ED Incinerator	Carbon Monoxide	11:36-13:35	1	27.5	27.5	2.8	-	-
ED Incinerator	Volatile Organic Compounds	11:36-13:35	1	32.1	32.1	9.6	-	-

Results Correct to

Temperature		Pressure		Oxygen		Gas	
°C/K	0/273	mbar/kPa	1013/101.3	%	-	Wet/Dry	Dry

All tests UKAS Accredited to BS EN ISO / IEC 17025 and MCERTS except where * shown

** Indicates where a value less than the limit of detection of the weighing procedure (0.5mg) has been reported, the value lies between the detection limit and zero. A value of half the limit of detection (0.5mg) has been used to calculate the concentration.

7. Deviations from Standard Methods

The sample plane does not comply upstream/downstream and the appropriate sampling ports are not fitted. The sample ports have been fitted to low access and was only available on one side, the sample time was doubled on the remaining sample line.

Part 2: Supporting Information - Appendices

Operator Company: -	STADCO Coventry
Address: -	Holbrook Lane, Coventry, CV6 4AW
Plant: -	ED Incinerator
Permit Number: -	PPC/058
Monitoring Date: -	14 January 2008
Monitoring Company: -	CES Environmental Instruments Ltd UKAS Accreditation Number: 2338
Address: -	Bretby Business Park, Ashby Road, Stanhope, Bretby Burton on Trent, DE15 0YZ
Analytical Company: -	CES Environmental Instruments Ltd UKAS Accreditation Number: 2338
Address: -	Bretby Business Park, Ashby Road, Stanhope, Bretby Burton on Trent, DE15 0YZ
Report Number: -	EI/4542
Report Date: -	21 January 2008

Test Team
D. Slack (MCERTS Level 2, TE1, TE4 MM 02 100)
M. Rodgers (MCERTS Level 2, TE1 MM 04 531)
A. Orme (MCERTS Level 1 MM 04 530)
D. Littlewood (MCERTS Level 1, TE1 MM 06 772)

Report authorised by [redacted]
R.M. Allen
MCERTS Reg No. MM 02 009

Contents

Appendix 1
(Extraction Protocol)

Site : STADCO
Date : 14 January 2008
Plant : ED Incinerator
File Ref. 4542

Mean Particulate Results

Filter	Time	mg/m³	m³/hr	mg/Nm³	Nm³/hr	kg/hr	
		(Actual Conditions)		(Reference Conditions)			
64398	11:10-12:11	0.8	1646	1.2	1025.4	0.001	
64390	12:17-13:18	0.2	1320	0.3	819.3	0.000	*
	Mean	0.5	1483.0	0.8	922.3	0.001	

* Indicates where a value less than the limit of detection of the weighing procedure (0.5mg) has been reported, the value lies somewhere between the detection limit and zero. A value of half the limit of detection (0.5mg) has been used to calculate the concentration.

Control Blank Filter

Filter	Volume (m³)	
64398	0.903	
64390	0.725	
Mean	0.814	(Reference Conditions with no correction for Oxygen)

Filter 42390

Tare Weight	**16884.3 mg**
Gross Weight	**16884.3 mg**
Gain	**0.0 mg**
Measured Oxygen	**%**
Concentration	**0.0 mg/Nm³**

Results Correct to

Temperature		Pressure		Oxygen		Gas	
°C/K	0/273	mbar/kPa	1013/101.3	%		Wet/Dry	Dry

protocol vT-measurement

14/01/2008 10:48
14/01/2008 10:53

engineer	MR/AO/DL
plant name	Incinerator
place	Stadco, Coventry
remarks	Normal Operations Dia = 200mm

operating parameter

normal density humid	[kg / m³]	: 1.3
water vapour	[%Vol]	: 15
ambient pressure	[mbar]	: 980
duct cross-section	[m²]	: 0.031

evaluation

meas. time	[h:m:s]	: 00:02:38
volume flow in duct		
actual conditions	[m³/h]	: 1507
in norm wet	[Nm³/h]	: 983
in norm dry	[Nm³/h]	: 835

protocol vT-measurement 14/01/2008 10:48
14/01/2008 10:53

measured values table

axis	depth	T_probe [°C]	v_duct [m/s]	angle [grd]	Q_set [m³/h]	meas. time [H:M:S]	p10 [mbar]	density [kg/m³]
1	1	121	12.3	1.0	0.62	00:00:14	0.00	0.87
1	2	124	12.9	0.7	0.62	00:00:06	0.00	0.87
1	3	126	12.7	1.2	0.63	00:00:07	0.00	0.86
1	4	128	13.4	3.0	0.62	00:00:08	1.00	0.86
1	5	129	14.0	0.0	0.65	00:00:06	1.00	0.85
1	6	131	13.0	0.9	0.65	00:00:10	0.00	0.85
1	7	138	14.7	3.6	0.95	00:00:06	1.00	0.84
1	8	140	13.3	4.2	0.74	00:00:05	0.00	0.83
1	9	140	14.4	0.0	0.72	00:00:04	0.00	0.83
1	10	144	14.3	2.0	0.72	00:01:32	0.00	0.82
		132	13.5	1.7	0.69		0.30	0.85

protocol simultaneous isokinetic extraction measurement

14/01/2008 11:10
14/01/2008 12:11

collector-no. 398

engineer	MR/AO/DL
plant name	Incinerator
place	Stadco, Coventry
remarks	Normal Operations Dia = 200mm

operating parameter

normal density humid	[kg / m³]	: 1.3
water vapour	[%Vol]	: 15
ambient pressure	[mbar]	: 980
duct cross-section	[m²]	: 0.031

extraction parameter

change of meas. point	[h:m:s]	: 00:15:00
points / axis		: 4
nozzles diameter	[mm]	: 6.4
isokinetic factor		: 1
tare weight	[mg]	: 17204.4
gross weight	[mg]	: 17205.7

evaluation

meas. time	[h:m:s]	: 01:00:00
dust weight	[mg]	: 1.30
extracted partial volume		
actual conditions	[m³]	: 1.715
in norm wet	[Nm³]	: 1.062
in norm dry	[Nm³]	: 0.903
volume flow in duct		
actual conditions	[m³/h]	: 1646
in norm wet	[Nm³/h]	: 1019
in norm dry	[Nm³/h]	: 866
dust concentration		
actual conditions	[mg/m³]	: 0.76
in norm wet	[mg/Nm³]	: 1.22
in norm dry	[mg/Nm³]	: 1.44

protocol simultaneous isokinetic extraction measurement 14/01/2008 11:10
14/01/2008 12:11

measured values table

axis	depth	T_probe [°C]	v_duct [m/s]	angle [grd]	Q_act. [m³/h]	volume [m³]	meas. time [H:M:S]	p10 [mbar]	p40 [mbar]
1	1	150	14.4	0.7	1.69	0.422	00:15:00	1.00	-26
1	2	155	14.6	0.7	1.69	0.423	00:15:00	0.00	-26
1	3	154	14.7	0.4	1.70	0.426	00:15:00	0.00	-26
1	4	154	15.3	-0.4	1.78	0.444	00:15:00	1.00	-28
		153	14.8	0.3	1.71	0.429		0.50	-27

protocol simultaneous isokinetic extraction measurement

14/01/2008 12:17
14/01/2008 13:18

collector-no. 390

engineer	MR/AO/DL
plant name	Incinerator
place	Stadco, Coventry
remarks	Normal Operations Dia = 200mm

operating parameter

normal density humid	[kg / m³]	: 1.3
water vapour	[%Vol]	: 15
ambient pressure	[mbar]	: 980
duct cross-section	[m²]	: 0.031

extraction parameter

change of meas. point	[h:m:s]	: 00:15:00
points / axis		: 4
nozzles diameter	[mm]	: 6.4
isokinetic factor		: 1
tare weight	[mg]	: 17310.4
gross weight	[mg]	: 17310.65

evaluation

meas. time	[h:m:s]	: 01:00:00
dust weight	[mg]	: 0.25
extracted partial volume		
actual conditions	[m³]	: 1.373
in norm wet	[Nm³]	: 0.853
in norm dry	[Nm³]	: 0.725
volume flow in duct		
actual conditions	[m³/h]	: 1320
in norm wet	[Nm³/h]	: 820
in norm dry	[Nm³/h]	: 697
dust concentration		
actual conditions	[mg/m³]	: 0.18
in norm wet	[mg/Nm³]	: 0.29
in norm dry	[mg/Nm³]	: 0.34

protocol simultaneous isokinetic extraction measurement 14/01/2008 12:17
14/01/2008 13:18

measured values table

axis	depth	T_probe [°C]	v_duct [m/s]	angle [grd]	Q_act. [m³/h]	volume [m³]	meas. time [H:M:S]	p10 [mbar]	p40 [mbar]
1	1	152	12.5	1.0	1.46	0.365	00:15:00	1.00	-19
1	2	154	12.3	1.3	1.42	0.356	00:15:00	0.00	-19
1	3	155	11.3	0.0	1.31	0.328	00:15:00	0.00	-17
1	4	153	11.2	-0.2	1.30	0.324	00:15:00	0.00	-17
		154	11.8	0.5	1.37	0.343		0.25	-18

Appendix 2
(Logged Values)

Site :	**STADCO Coventry**
Date :	**14 January 2008**
Plant :	**ED Incinerator**
File Ref.	**4542**

Date	Oxygen	Carbon	Carbon	Nitric	Oxides of	VOCs	VOCs
39461.0		Monoxide	Monoxide	Oxide	Nitrogen (NO2)		
Time	%	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³
Mean Value (11:36-12:35)	19.8	23	29	3	5	19	31
Mean Value (12:36-13:35)	19.8	21	26	2	4	21	33
Max Test Result	19.8	23.5	29.3	2.5	5.2	20.6	33.2
Min Test Result	19.8	20.5	25.6	2.1	4.3	19.3	31.0
Mean Test Result	19.8	22.0	27.5	2.3	4.7	20.0	32.1

Results correct to

Temperature		Pressure		Oxygen		Gas	
°C/K	0/273	mbar/kPa	1013/101.3	%		Dry	Dry

Site : STADCO Coventry
Date : 14 January 2008
Plant : ED Incinerator
File Ref. 4542

Date	Oxygen	Carbon	Carbon	Nitric	Oxides of	VOCs	VOCs
14/01/2008		Monoxide	Monoxide	Oxide	Nitrogen (NO2)		
Time	%	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³
11:36	19.9	22	28	3	5	18	29
11:37	19.8	22	28	3	5	15	25
11:38	19.7	38	47	3	6	15	25
11:39	19.7	26	33	3	6	16	26
11:40	19.7	26	32	3	6	18	28
11:41	19.7	26	32	3	6	20	31
11:42	19.7	26	32	3	6	22	36
11:43	19.7	24	30	3	6	23	37
11:44	19.8	22	28	3	6	23	37
11:45	19.7	24	30	3	6	22	35
11:46	19.7	28	35	3	6	20	32
11:47	19.6	26	32	3	6	21	34
11:48	19.6	27	33	3	6	21	34
11:49	19.6	30	37	3	6	22	35
11:50	19.7	29	36	3	6	21	33
11:51	19.7	29	36	3	5	7	12
11:52	19.8	27	33	3	5	9	14
11:53	19.8	25	31	3	5	29	47
11:54	19.7	25	31	3	6	31	50
11:55	19.6	27	34	3	5	18	29
11:56	19.6	28	34	3	5	1	1
11:57	19.7	26	32	2	5	36	57
11:58	19.8	23	29	2	5	5	7
11:59	19.9	21	27	2	5	21	33
12:00	19.9	21	26	2	5	26	42
12:01	20.0	20	25	2	4	30	48
12:02	19.9	21	26	2	5	30	49
12:03	19.8	24	30	3	5	28	45
12:04	19.7	26	32	3	5	27	43
12:05	19.6	27	34	3	5	25	41
12:06	19.7	26	33	3	5	24	39
12:07	19.7	25	32	2	5	24	39
12:08	19.8	24	30	2	5	24	38
12:09	19.9	23	28	2	5	23	37
12:10	19.9	22	28	2	5	23	37
12:11	19.8	21	26	2	5	21	34
12:12	19.8	23	29	2	5	22	35
12:13	19.7	23	29	3	5	21	33
12:14	19.7	23	29	3	5	19	31
12:15	19.7	24	31	3	5	18	30
12:16	19.8	22	28	2	5	18	29
12:17	19.8	21	27	2	5	18	28
12:18	19.9	21	26	2	5	18	28
12:19	19.9	19	24	2	4	18	29
12:20	19.9	19	24	2	4	17	27
12:21	19.8	21	26	2	5	16	26
12:22	19.8	22	28	2	5	15	24
12:23	19.8	22	27	2	5	14	23
12:24	19.8	26	32	2	5	14	22
12:25	19.8	22	27	2	5	14	23
12:26	19.8	21	26	2	5	15	24
12:27	19.8	20	25	2	5	15	25
12:28	19.9	19	24	2	5	15	24
12:29	19.8	19	24	2	5	15	23
12:30	19.8	18	23	2	5	14	22
12:31	19.8	20	25	2	5	16	26
12:32	19.7	20	25	2	5	16	26
12:33	19.8	19	24	2	5	17	27
12:34	19.9	19	24	2	5	18	29
12:35	19.9	18	23	2	5	18	29
Max Test Result	**20.0**	**37.7**	**47.2**	**3.0**	**6.1**	**35.6**	**57.3**
Min Test Result	**19.6**	**18.0**	**22.6**	**2.2**	**4.4**	**0.6**	**1.0**

Mean Test Result	**19.8**	**23.5**	**29.3**	**2.5**	**5.2**	**19.3**	**31.0**

Results Correct to

Temperature		Pressure		Oxygen		Gas	
°C/K	0/273	mbar/kPa	1013/101.3	%		Wet/Dry	Dry

Site : STADCO Coventry
Date : 14 January 2008
Plant : ED Incinerator
File Ref. 4542

Date	Oxygen	Carbon	Carbon	Nitric	Oxides of	VOCs	VOCs
14/01/2008		Monoxide	Monoxide	Oxide	Nitrogen (NO2)		
Time	%	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³
12:36	20.0	18	22	2	5	19	30
12:37	20.0	17	21	2	4	19	30
12:38	19.9	18	22	2	4	17	28
12:39	19.8	19	24	2	5	19	31
12:40	19.7	21	26	2	5	21	33
12:41	19.7	22	28	2	5	20	32
12:42	19.8	22	27	2	5	21	34
12:43	19.8	20	26	2	4	23	37
12:44	19.9	20	25	2	5	25	40
12:45	19.9	19	24	2	4	24	38
12:46	19.9	18	23	2	4	24	39
12:47	19.8	20	25	2	5	23	36
12:48	19.8	21	26	2	5	22	35
12:49	19.7	22	27	2	5	21	34
12:50	19.8	20	25	2	4	20	32
12:51	19.8	20	25	2	4	19	30
12:52	19.9	20	25	2	4	19	30
12:53	19.9	19	24	2	4	18	29
12:54	19.9	18	22	2	4	19	31
12:55	19.9	18	23	2	4	18	30
12:56	19.9	20	25	2	4	16	26
12:57	19.8	20	25	2	4	18	28
12:58	19.8	20	25	2	5	17	28
12:59	19.7	20	25	2	5	19	30
13:00	19.8	20	25	2	4	20	31
13:01	19.8	20	25	2	4	20	32
13:02	19.8	19	24	2	4	21	34
13:03	19.9	18	22	2	4	20	32
13:04	19.9	19	24	2	4	20	32
13:05	19.8	21	26	2	5	20	32
13:06	19.7	23	29	2	5	21	33
13:07	19.7	24	30	2	5	23	36
13:08	19.7	23	29	2	5	24	38
13:09	19.8	23	29	2	5	25	40
13:10	19.8	22	27	2	4	24	39
13:11	19.9	20	25	2	4	24	38
13:12	19.9	19	24	2	4	22	35
13:13	19.8	22	27	2	4	21	33
13:14	19.7	24	30	2	4	21	33
13:15	19.7	24	30	2	4	21	33
13:16	19.7	23	29	2	4	21	34
13:17	19.8	22	27	2	4	22	35
13:18	19.9	20	25	2	4	22	36
13:19	20.0	19	23	2	4	22	36
13:20	20.0	17	21	2	4	22	35
13:21	20.0	18	23	2	4	21	34
13:22	19.8	20	25	2	4	19	30
13:23	19.7	22	28	2	4	20	31
13:24	19.7	23	28	2	4	19	31
13:25	19.7	22	28	2	4	5	9
13:26	19.8	21	27	2	4	29	46
13:27	19.8	20	26	2	4	27	43
13:28	19.9	20	25	2	4	0	0
13:29	19.9	19	23	2	4	0	0
13:30	19.9	19	24	2	4	31	50
13:31	19.8	20	26	2	4	28	45
13:32	19.7	22	27	2	4	30	47
13:33	19.6	23	29	2	4	25	40
13:34	19.6	23	29	2	4	24	39
13:35	19.7	24	30	2	5	28	45
Max Test Result	**20.0**	**24.3**	**30.4**	**2.4**	**4.9**	**31.1**	**50.0**
Min Test Result	**19.6**	**16.7**	**20.9**	**1.8**	**3.6**	**0.2**	**0.3**
Mean Test Result	**19.8**	**20.5**	**25.6**	**2.1**	**4.3**	**20.6**	**33.2**

Results Correct to

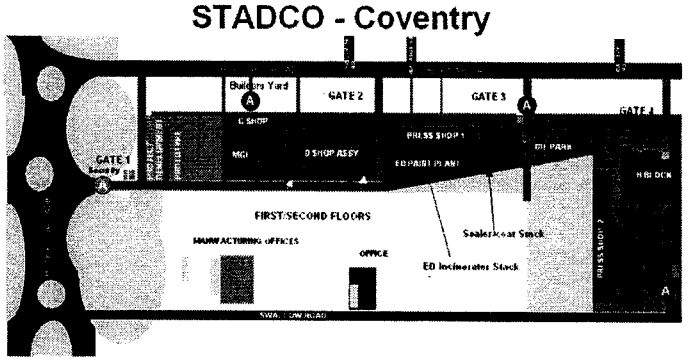
Temperature		Pressure		Oxygen		Gas	
°C/K	0/273	mbar/kPa	1013/101.3	%		Wet/Dry	Dry

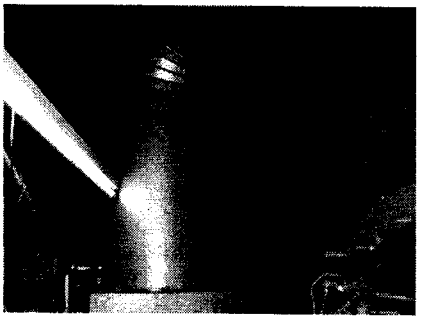
Appendix 3
(Process Data)

Process Data

1. ED Incinerator

The ED Incinerator was operating at normal conditions and continuously during the sampling period.





Electro Dip Particulates & VOC Monitoring 14/1/08														
Materials Used During Monitoring Exercise														
Manufacturer				Parts Dipped				Description			Type/ identity number		
PPG				As per log sheet				Powercron 6200			ED Generation 6		
Time	Product	Time	Product	Time	Product	Time	Product	Time	Product	Time	Product	Time	Product
07:08:45	No production Pre-Treatment burners not up to temperature	09:20:00	Roofs + 305 bodysides	11:31:15	Taxi & parts	13:42:30	Taxi & parts	15:43:45	Empty	18:05:00		20:16:15	
07:17:30		09:28:45	Rover doors	11:40:00	803 Roofs	13:51:15	Roofs +803 b/s 10 RMC	16:02:30	Empty	18:13:45		20:25:00	
07:26:15		09:37:30	Roofs + 803 hoods	11:48:45	Roofs + spl spares	14:00:00	Roofs + 305 Roofs	16:11:15	Empty	18:22:30		20:00	
07:35:00		09:46:15	Taxi & parts	11:57:30	305 bodyside r/h (5 off)	14:08:45	Taxi	16:20:00	Taxi	18:31:15			
07:43:45		09:55:00	roofs + rem plates	12:06:15	Roofs + 803 Hoods	14:17:30	305 Doors (12 l/h)	16:28:45	305 Doors (12 l/h)	18:40:00			
07:52:30	Taxi & parts	10:03:45	Roofs + spl parts	12:15:00	Doors	14:26:15	Taxi	16:37:30	Roofs + 305 Bodysides (20 l/h)	18:48:15			
08:01:15	Taxi & parts (x2)	10:12:30	Roofs + spl parts	12:23:45	Roofs + Rover Spares	14:35:00	Roofs + 305 Roofs	16:46:15	Roofs + Rover Doors	18:57:30			
08:10:00	Taxi & parts (x2)	10:21:15	803 Doors	12:32:30	MGTF Car	14:43:45	305 Doors (12 r/h)	16:55:00		19:06:15			
08:18:45	Roofs + 303 bodysides (5 l/h)	10:30:00	Taxi	12:41:15	Roofs + Fablink Doors	14:52:30	Roofs + Rover Spares	17:03:45		19:15:00			
08:27:30	Roofs + spl spares	10:38:45	roofs + rem plates	12:50:00	Roofs + 305 b/s (10)	15:01:15	Rover Doors	17:12:30		19:23:45			
08:36:15	Taxi & parts + spl spares	10:47:30	Rover doors	12:58:45	Roofs + Rover Doors	15:10:00	NWA	17:21:15		19:32:30			
08:45:00	Taxi & parts	10:56:15	Roofs + Screens	13:07:30	MGTF Car	15:18:45	Taxi	17:30:00		19:41:15			
08:53:45	305 doors x12 + roofs	11:05:00	Rover doors	13:16:15	MGTF Car	15:27:30	Roofs + 305 bodysides (5 r/h)	17:38:45		19:50:00			
09:02:30	roofs x 2	11:13:45	Roofs + 803 r/h & l/h sides	13:25:00	Roofs + 305 Bodysides	15:36:15	Roofs x 2	17:47:30		19:58:45			
09:11:15	Taxi & parts	11:22:30	Taxi & parts	13:33:45	Taxi & parts	15:45:00	Roofs	17:56:15		20:07:30			

Appendix 4
(Equipment Calibration Certificate)

Certificate of Calibration

Date of Issue: 3 July 2007

Certificate No. CES0425

CES Environmental Instruments Ltd
Bretby Business Park, Ashby Road
Burton-on-Trent, Staffordshire, DE15 0YZ
Tel: 01283 216334 Fax: 01283 550939

[redacted]

Certified By

Instrument Details

Instrument Type	Gravimat SHC502AE
Instrument Make	Erwin Sick
Instrument Serial No.	05218792
Quality No.	C193
Calibration Date	03/07/07
Calibrated By Name	R. Allen

Ambient Conditions

Air Temperature (°C)	19	**
Barometric Pressure (mbar)	998	
Relative Humidity (%)	55	**

Instruments used to undertake calibration

E Type Pitot	UKAS Certificate No. N13497/07	(Qu. No. C136)
Manometer Type FC012	UKAS Certificate No. 03616	(Qu. No. C082)
Manometer Type FC012	UKAS Certificate No. 03617	(Qu. No. C081)
Barometer Type 104	UKAS Certificate No. N3034492P	(Qu. No. C138)
Gallus Dry Gas Meter	UKAS Certificate No. N3027578F	(Qu. No. C125)
RIS Supersal XT	UKAS Certificate No. N3027577E	(Qu. No. C014)

* Not UKAS traceable ** Indication only

Flow and Extraction

The reference pitot was placed in a wind tunnel located at Bretby Business Park. The Gravimat SHC-5 Sampling Probe under test was mounted within the same wind tunnel in close proximity to the reference pitot. The wind tunnel was operated to generate a differential pressure across each pitot, a direct comparison was made. The differential pressures measured were in the region of the caibration points of the reference pitot. Correction factors were applied to the reference pitot and compared to the differential pressure shown for the pitot under test. The extraction system of the unit was operated for a period of one minute.

Volume Flow

A calibrated dry gas meter was connected to the sampling nozzel ot the Gravimat SCH-5. A volume of air is pulled through the sampling system. The measured value shown on the calibrated dry gas meter is then compared to the indicated value on the Gravimat SCH-5 display.

Barometric Pressure

The barometric pressure was measured using a calibrated barometer. The indicated pressure was compared to the Gravimat SHC-5 display.

Temperature

The probe thermocouple was placed in a thermpcouple oven and heated. The temperature was measured using a calibrated thermocouple and temperature indicator. The resultant temperature was compared to the Gravimat SCH-5 display.

Current

A mA current source was injected into the Gravimat SCH-5 using a mA current generator. The injected current was compared to the Gravimat SCH-5 display.

Certificate of Calibration

Date of Issue: 3 July 2007

Bretby Business Park, Ashby Road
Burton-on-Trent, Staffordshire, DE15 0YZ
Tel: 01283 216334 Fax: 01283 550939

[redacted] CES0425

Certified By

Instrument Details

Instrument Type	Gravimat SHC502AE
Instrument Make	Erwin Sick
Instrument Serial No.	05218792
Quality No.	C193
Calibration Date	03/07/07

Ambient Conditions

Air Temperature (°C)	19	**
Barometric Pressure (mbar)	998	
Relative Humidity (%)	55	**
Air Density @ 0°C (kg/m³)	1.277	
Corrected Air Density (kg/m³)	1.1762	

Calibration Details

Flow and Extraction

Applied Pressure (Pa)	Pitot Correction	Applied Pressure Corrected (Pa)	SHC5 p-dyn (Pa)	Pressure Factor	Calculated Velocity (m/s)	SHC5 Velocity (m/s)	Velocity Factor
4.2	0.985	4.1	4.0	**1.04**	2.652	2.600	**1.02**
44.8	0.991	44.4	44.5	**1.00**	8.689	8.700	**1.00**
101.3	0.992	100.5	100.9	**1.00**	13.072	13.100	**1.00**
160.5	0.993	159.4	160.1	**1.00**	16.462	16.500	**1.00**
218.0	0.993	216.5	219.1	**0.99**	19.185	19.300	**0.99**
Mean (excluding 4.0Pa)				**0.99**			**1.00**

Volume Flow

Nominal Flow Rate	Actual Flow Rate	Actual Flow Rate	Orifice Constant
l/min	l/min	m³/hr	
15.000	15.067	0.904	13.00
20.000	20.350	1.221	13.09
25.000	24.980	1.499	13.04
30.000	30.200	1.812	13.02
Instrument Orifice Constant(@1.5m³/hr) =			**13.04**

Barometric Pressure

Pressure	
Required Value (mbar)	Indicated Value (mbar)
998.0	998.0
1001.0	1001.0
1003.0	1003.0

Temperature

Temperature Input	
Required Value (°C)	Indicated Value (°C)
25.0	25.1
50.0	50.0
100.0	100.0
150.0	150.0
250.0	249.8
300.0	300.0

Current

Current Value	
Required Value (mA)	Indicated Value (mA)
0.0	0.0
5.0	5.0
10.0	10.0
15.0	15.0
20.0	20.0

Time

Time Period mins	Required Value mins	Within Limit
3:00	2:59 → 3:01	Yes
5:00	4:59 → 5:01	Yes
10:00	9:59 → 10:01	Yes

CES Environmental Instruments Ltd

GAS ANALYSER CALIBRATION SHEET

Gas Analyser Calibration		Client	STADO	Date	14/01/2008
Instrument Type	Horiba	Job Number	4542	Test	1
Quality No.	C190	Site	ED Incinerator	Test Period	11:36-13:35

Range - Nitrogen (N2)	%
Range - Carbon Dioxide (CO2)	%
Range - Oxygen (O2)	25%
Range - Carbon Monoxide (CO)	200ppm
Range - Nitric Oxide (NO)	250ppm
Range - Nitrogen Dioxide (NO2)	ppm
Range - Sulphur Dioxide (SO2)	ppm
Range - Propane (C3H8)	100ppm

Zero Gas - Nitrogen (N_2)	%	Certificate Number:	
Span Gas 1 - Carbon Dioxide (CO_2)	%	Certificate Number:	
Span Gas 1 - Oxygen (O_2)	%	Certificate Number:	
Span Gas 1 - Carbon Monoxide (CO)	100ppm	Certificate Number:	16883-1-1
Span Gas 1 - Nitric Oxide (NO)	103ppm	Certificate Number:	16880-1-1
Span Gas 1 - Nitrogen Dioxide (NO_2)	ppm	Certificate Number:	
Span Gas 1 - Sulphur Dioxide (SO_2)	ppm	Certificate Number:	
Span Gas 1 - Propane (C3H8)	10ppm	Certificate Number:	13918-2-1

Span Gas 2 - Carbon Dioxide (CO_2)	%	Certificate Number:	
Span Gas 2 - Oxygen (O_2)	%	Certificate Number:	
Span Gas 2 - Carbon Monoxide (CO)	10 ppm	Certificate Number:	16883-1-1
Span Gas 2 - Nitric Oxide (NO)	10ppm	Certificate Number:	16880-1-1
Span Gas 2 - Nitrogen Dioxide (NO_2)	ppm	Certificate Number:	
Span Gas 2 - Sulphur Dioxide (SO_2)	ppm	Certificate Number:	
Span Gas 2 - Propane (C3H8)	ppm	Certificate Number:	

Calibration Check - Pre-Sampling Test Gas Entered - Instrument	CO_2	O_2	CO	NO	NO_2	SO_2	C_3H_8
Zero Reading	0.13	0.02	0.4	0.6		0	0
Span Gas 1 Reading			100	107.6			10
Zero Reading			98.9				
Ambient Air		20.59	0	0		0	

Calibration Check - Pre-Sampling Test Gas Entered - Probe	CO_2	O_2	CO	NO	NO_2	SO_2	C_3H_8
Zero Reading							
Span Gas 1 Reading							
Span Gas 2 Reading							
Ambient Air							

Calibration Check - Mid / Post Sampling Test Gas Entered - Probe	CO_2	O_2	CO	NO	NO_2	SO_2	C_3H_8
Zero Reading	0.03	0.04	0	0.2		0	0
Span Gas 1 Reading				99.8			9.9
Span Gas 2 Reading			100				
Ambient Air	0.09	21.01	0	0		0	0

Checks completed by: David Slack

STADCO Coventry

Determination of Particulates
On the Sealer Coat Plant
Holbrook Lane, Coventry
CV6 4AW

14 January 2008

Prepared by: **CES Environmental Instruments Ltd**
Bretby Business Park
Ashby Road
Stanhope Bretby
Burton Upon Trent
DE15 OYZ

Telephone 01283 21633[redacted]

Report prepared by [redacted]
D.J. Slack
MCERTS Reg No. MM 02 100

Report authorised by [redacted].....
R.M. Allen
MCERTS Reg No. MM 02 009

UKAS TESTING
2338

mCERTS

Contents

Part 1: Executive Summary

Operator Company: -	STADCO Coventry
Address: -	Holbrook Lane, Coventry, CV6 4AW
Plant: -	Sealer Coat Plant
Permit Number: -	PPC/058
Monitoring Date: -	14 January 2008
Monitoring Company: -	CES Environmental Instruments Ltd UKAS Accreditation Number: 2338
Address: -	Bretby Business Park, Ashby Road, Stanhope, Bretby Burton on Trent, DE15 0YZ
Analytical Company: -	CES Environmental Instruments Ltd UKAS Accreditation Number: 2338
Address: -	Bretby Business Park, Ashby Road, Stanhope, Bretby Burton on Trent, DE15 0YZ
Report Number: -	EI/4554
Report Date: -	21 January 2008

Monitoring Objective
To monitor and quantify particulate emissions to atmosphere from the Sealer Coat Plant located at STADCO, Coventry.

Test Team
D. Slack (MCERTS Level 2, TE1, TE4 MM 02 100)
M. Rodgers (MCERTS Level 2, TE1 MM 04 531)
A. Orme (MCERTS Level 1 MM 04 530)
D. Littlewood (MCERTS Level 1, TE1 MM 06 772)

Report authorised by ..[redacted]
R.M. Allen
MCERTS Reg No. MM 02 009

Results
Date of Sampling: 14 January 2008

Location	Pollutant	Start and End Times	Test No.	Concentration mg/Nm³	Mean Concentration mg/Nm³	Uncertainty (±) mg/Nm³	Emission Rate kg/hr	Mean Emission Rate kg/hr
Sealer Coat Plant	Particulate	11:11-11:52	1	1.1	1.2	0.4	0.055	0.062
Sealer Coat Plant	Particulate	11:56-12:38	2	1.3			0.069	
Sealer Coat Plant	Particulate	-	Blank	0.0	0.0	-	-	-

Results Correct to

Temperature		Pressure		Oxygen		Gas	
°C/K	0/273	mbar/kPa	1013/101.3	%	-	Wet/Dry	Wet

All tests UKAS Accredited to BS EN ISO / IEC 17025 and MCERTS except where * shown

1. Introduction

STADCO placed a contract with CES Environmental Instruments Ltd to monitor and quantify the particulate emissions emitted to atmosphere from the Sealer Coat Plant. The test work was undertaken on 14 January 2008 by CES Environmental Instruments Ltd Engineers. This report described the work carried out and the results obtained.

2. Plant and Process Details and Authorisation Limits

2.1 Seal Coat Plant

The Seal Coat Plant is a wetback filter system with a single fan and stack. This is used for compliant coatings only.

2.2 Authorisation Limits

The authorisation limits as set out under Coventry City Council, Authorisation Number PPC/058.

Particulates 50 mg/m^3

3. Sampling Location

Orientation	Dimensions	Cross Sectional Area	Sample Ports Available/Used	Sampling Positions Per Plane	Standard
Vertical	1400mm x 1100mm	1.54m^2	2/2	8	BS EN 13284-1

Comments:
Sample ports: 2 off 4" BSP sockets
Sample times are calculated from the total sample time equally divided by the no. of sample positions per plane. Sample time per position must be greater than 3mins.
Pitot Traverse
Along lines A & B at positions consistent with BS 13284-1 these positions are:
6.7%, 25.0%, 75.0%, 93.3%
(10 point traverse if required 2.6%, 8.2%, 14.6%, 22.6%, 34.2%, 65.8%, 77.4%, 85.4%, 91.8%, 97.4%)
Sample Positions
Along lines A & B at as many of the positions required within the standard method as can be achieved given the clearance limitations behind each socket. BS 13284-1 requires sampling at 8 points (4 on each of two lines) these positions are:
6.7%, 25.0%, 75.0%, 93.3%

	Yes	No
Does the sample plane comply upstream?		✓*
Does the sample plane comply downstream?		✓*
Are the appropriate sample ports fitted?	✓	
Does the velocity air temperature profile comply?	✓	
Minimum platform area >5m^2		✓

*BS EN13284-1:2001 has a general requirement that the sampling plane shall be in a straight section of duct at least 5 hydraulic diameters downstream and 2 hydraulic diameters upstream of any bend or obstruction which could produce turbulent flow.

4. Sampling Methods

Pollutant	Method	CES Procedure	Equipment	Uncertainty (±)	LOD	Accreditation	Sealer Coat
Particulates	BS EN 13284-1	WI4/1	C193	30%	0.5mg	UKAS, MCERTS	✓

Sampling Equipment: Gravimat: CES Reference C193

5. Sample Analysis

Determinand	Method	Laboratory	Date of Analysis	UKAS Accredited
Particulate	Gravimetric	CESEI	15/01/08	Y

6. Summary of Results

Location	Pollutant	Start and End Times	Test No.	Concentration mg/Nm³	Mean Concentration mg/Nm³	Uncertainty (±) mg/Nm³	Emission Rate kg/hr	Mean Emission Rate kg/hr
Sealer Coat Plant	Particulate	11:11-11:52	1	1.1	1.2	0.4	0.055	0.062
Sealer Coat Plant	Particulate	11:56-12:38	2	1.3			0.069	
Sealer Coat Plant	Particulate	-	Blank	0.0	0.0	-	-	-

Results Correct to

Temperature		Pressure		Oxygen		Gas	
°C/K	0/273	mbar/kPa	1013/101.3	%	-	Wet/Dry	Wet

All tests UKAS Accredited to BS EN ISO / IEC 17025 and MCERTS except where * shown

7. Deviations from Standard Methods

The sample plane does not comply upstream/downstream.
The sample platform does not comply with the standard.

Part 2: Supporting Information - Appendices

Operator Company: - STADCO Coventry

Address: - Holbrook Lane, Coventry, CV6 4AW

Plant: - Sealer Coat (ED) Plant

Permit Number: - PPC/058

Monitoring Date: - 14 January 2008

Monitoring Company: - CES Environmental Instruments Ltd
UKAS Accreditation Number: 2338

Address: - Bretby Business Park, Ashby Road, Stanhope, Bretby
Burton on Trent, DE15 0YZ

Analytical Company: - CES Environmental Instruments Ltd
UKAS Accreditation Number: 2338

Address: - Bretby Business Park, Ashby Road, Stanhope, Bretby
Burton on Trent, DE15 0YZ

Report Number: - EI/4554

Report Date: - 21 January 2008

Test Team
D. Slack (MCERTS Level 2, TE1, TE4 MM 02 100)
M. Rodgers (MCERTS Level 2, TE1 MM 04 531)
A. Orme (MCERTS Level 1 MM 04 530)
D. Littlewood (MCERTS Level 1, TE1 MM 06 772)

Report authorised by [redacted]
R.M. Allen
MCERTS Reg No. MM 02 009

Contents

Appendix 1
(Extraction Protocol)

Site : STADCO
Date : 14 January 2008
Plant : Sealer Coat Plant
File Ref. 4554

Mean Particulate Results

Filter	Time	mg/m³	m³/hr	mg/Nm³	Nm³/hr	kg/hr
		(Actual Conditions)		(Reference Conditions)		
642084	11:11-11:52	1.0	56687	1.1	51874.0	0.055
80336	11:56-12:38	1.2	57173	1.3	52408.6	0.069
	Mean	1.1	56930.0	1.2	52141.3	0.062

Control Blank Filter

Filter	Volume (m³)
642084	1.134
80336	1.139
Mean	1.137

(Reference Conditions with no correction for Oxygen)

Filter 42396

Tare Weight 17102.4 mg
Gross Weight 17102.4 mg

Gain 0.0 mg

Measured Oxygen %

Concentration 0.0 mg/Nm³

Results Correct to

Temperature		Pressure		Oxygen		Gas	
°C/K	0/273	mbar/kPa	1013/101.3	%		Wet/Dry	Wet

protocol vT-measurement

14/01/2008 11:03
14/01/2008 11:11

engineer	MR/AO
plant name	Sealer Coat Plant
place	Stadco, Coventry
remarks	Normal Operation Dim = 1400 x 1100mm

operating parameter

normal density humid	[kg / m³]	: 1.3
water vapour	[%Vol]	: 10
ambient pressure	[mbar]	: 978
duct cross-section	[m²]	: 1.54

evaluation

meas. time	[h:m:s]	: 00:03:23
volume flow in duct		
actual conditions	[m³/h]	: 56881
in norm wet	[Nm³/h]	: 52068
in norm dry	[Nm³/h]	: 46862

protocol vT-measurement 14/01/2008 11:03
14/01/2008 11:11

measured values table

axis	depth	T_probe [°C]	v_duct [m/s]	angle [grd]	Q_set [m³/h]	meas. time [H:M:S]	p10 [mbar]	density [kg/m³]
1	1	14	10.6	2.3	1.85	00:00:10	1.00	1.19
1	2	14	10.6	0.8	1.90	00:00:10	1.00	1.19
1	3	14	10.2	3.1	1.86	00:00:11	1.00	1.19
1	4	14	10.0	0.3	1.85	00:00:10	1.00	1.19
1	5	15	10.2	3.1	1.80	00:00:10	1.00	1.19
1	6	15	10.2	5.5	1.83	00:00:10	1.00	1.19
1	7	15	10.4	2.2	1.85	00:00:10	1.00	1.19
1	8	15	10.1	-2.5	1.84	00:00:10	1.00	1.19
1	9	15	10.2	-2.3	1.84	00:00:10	1.00	1.19
1	10	15	10.2	-3.2	1.86	00:00:11	1.00	1.19
2	1	15	10.4	0.3	1.77	00:00:11	1.00	1.19
2	2	15	10.4	0.0	1.84	00:00:10	1.00	1.19
2	3	15	10.2	0.2	1.85	00:00:10	1.00	1.19
2	4	15	10.2	0.2	1.85	00:00:10	1.00	1.19
2	5	15	10.3	0.5	1.85	00:00:10	1.00	1.19
2	6	15	10.0	0.0	1.86	00:00:10	1.00	1.19
2	7	15	10.6	-0.3	1.86	00:00:10	1.00	1.19
2	8	15	10.0	0.1	1.86	00:00:10	1.00	1.19
2	9	15	10.1	0.1	1.83	00:00:10	1.00	1.19
2	10	15	10.3	-0.1	1.86	00:00:10	1.00	1.19
		15	10.3	0.5	1.85		1.00	1.19

protocol simultaneous isokinetic extraction measurement

14/01/2008 11:11
14/01/2008 11:52

collector-no. 2084

engineer	MR/AO
plant name	Sealer Coat Plant
place	Stadco, Coventry
remarks	Normal Operation Dim = 1400 x 1100mm

operating parameter

normal density humid	[kg / m³]	: 1.3
water vapour	[%Vol]	: 10
ambient pressure	[mbar]	: 978
duct cross-section	[m²]	: 1.54

extraction parameter

change of meas. point	[h:m:s]	: 00:05:00
points / axis		: 4
nozzles diameter	[mm]	: 8
isokinetic factor		: 1
tare weight	[mg]	: 18140.5
gross weight	[mg]	: 18141.7

evaluation

meas. time	[h:m:s]	: 00:40:00
dust weight	[mg]	: 1.20
extracted partial volume		
actual conditions	[m³]	: 1.239
in norm wet	[Nm³]	: 1.134
in norm dry	[Nm³]	: 1.021
volume flow in duct		
actual conditions	[m³/h]	: 56687
in norm wet	[Nm³/h]	: 51891
in norm dry	[Nm³/h]	: 46702
dust concentration		
actual conditions	[mg/m³]	: 0.97
in norm wet	[mg/Nm³]	: 1.06
in norm dry	[mg/Nm³]	: 1.17

protocol simultaneous isokinetic extraction measurement 14/01/2008 11:11
14/01/2008 11:52

measured values table

axis	depth	T_probe [°C]	v_duct [m/s]	angle [grd]	Q_act. [m³/h]	volume [m³]	meas. time [H:M:S]	p10 [mbar]	p40 [mbar]
1	1	15	10.1	0.1	1.87	0.156	00:05:00	1.00	-28
1	2	15	10.1	0.1	1.83	0.153	00:05:00	1.00	-28
1	3	15	10.2	0.0	1.85	0.154	00:05:00	1.00	-28
1	4	15	10.2	0.1	1.85	0.154	00:05:00	1.00	-28
2	1	15	10.3	0.0	1.86	0.155	00:05:00	1.00	-28
2	2	15	10.3	0.1	1.87	0.156	00:05:00	1.00	-29
2	3	15	10.3	0.1	1.87	0.156	00:05:00	1.00	-29
2	4	15	10.3	0.1	1.86	0.155	00:05:00	1.00	-29
		15	10.2	0.1	1.86	0.155		1.00	-28

protocol simultaneous isokinetic extraction measurement

14/01/2008 11:56
14/01/2008 12:38

collector-no. 336

engineer	MR/AO
plant name	Sealer Coat Plant
place	Stadco, Coventry
remarks	Normal Operation Dim = 1400 x 1100mm

operating parameter

normal density humid	[kg / m³]	: 1.3
water vapour	[%Vol]	: 10
ambient pressure	[mbar]	: 978
duct cross-section	[m²]	: 1.54

extraction parameter

change of meas. point	[h:m:s]	: 00:05:00
points / axis		: 4
nozzles diameter	[mm]	: 8
isokinetic factor		: 1
tare weight	[mg]	: 17623.4
gross weight	[mg]	: 17624.9

evaluation

meas. time	[h:m:s]	: 00:40:00
dust weight	[mg]	: 1.50
extracted partial volume		
actual conditions	[m³]	: 1.244
in norm wet	[Nm³]	: 1.139
in norm dry	[Nm³]	: 1.025
volume flow in duct		
actual conditions	[m³/h]	: 57173
in norm wet	[Nm³/h]	: 52335
in norm dry	[Nm³/h]	: 47101
dust concentration		
actual conditions	[mg/m³]	: 1.21
in norm wet	[mg/Nm³]	: 1.32
in norm dry	[mg/Nm³]	: 1.46

protocol simultaneous isokinetic extraction measurement 14/01/2008 11:56
14/01/2008 12:38

measured values table

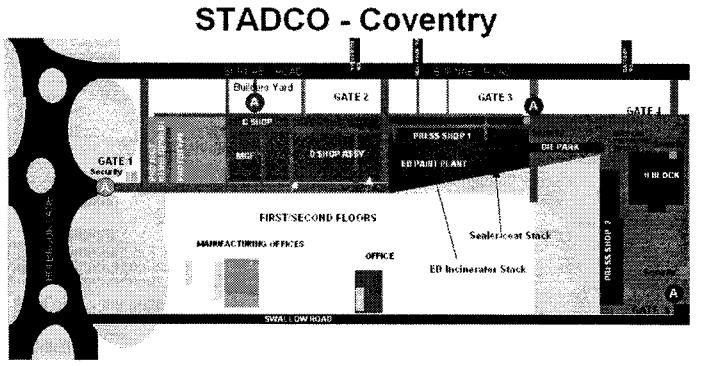
axis	depth	T_probe [°C]	v_duct [m/s]	angle [grd]	Q_act. [m³/h]	volume [m³]	meas. time [H:M:S]	p10 [mbar]	p40 [mbar]
1	1	15	10.3	-0.4	1.86	0.155	00:05:00	1.00	-26
1	2	15	10.4	-0.6	1.87	0.156	00:05:00	0.00	-26
1	3	15	10.3	-0.5	1.86	0.155	00:05:00	1.00	-26
1	4	15	10.4	-0.5	1.88	0.157	00:05:00	1.00	-26
2	1	15	10.3	-0.7	1.87	0.156	00:05:00	1.00	-26
2	2	15	10.3	-0.5	1.86	0.155	00:05:00	1.00	-26
2	3	15	10.2	-0.5	1.85	0.154	00:05:00	0.00	-26
2	4	15	10.3	-0.8	1.87	0.156	00:05:00	0.00	-26
		15	10.3	-0.6	1.87	0.156		0.63	-26

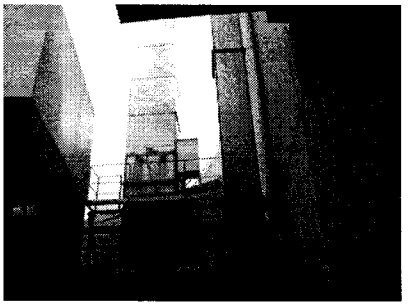
Appendix 2
(Process Data)

Process Data

1. Sealer Coat Plant

The Sealer Coat Plant was operating at normal conditions and continuously during the sampling period.





Sealercoat Particulates Monitoring 14/01/08			
Materials Used During Monitoring Exercise			
Manufacturer	**Parts Sprayed**	**Description**	**Type/ identity number**
PPG	Taxis & Parts 07.00 TO 16.30	1K Waterborne Primer CA-ral-7011-Stadcogrey	27/12/06 No 602398
Notes	16 Off Taxis & 16 Sets of Parts (Bonnet, wings etc.) Shift started at 7.00am and finished at 16.30	30 minute lunch break between 12.30 to 1.0	

Appendix 3
(Equipment Calibration Certificate)

Certificate of Calibration

Date of Issue: 3 July 2007

Certificate No. CES0425
Page 1 of 2

CES Environmental Instruments Ltd
Bretby Business Park, Ashby Road
Burton-on-Trent, Staffordshire, DE15 0YZ
Tel: 01283 216334 Fax: 01283 550939

[redacted]
Certified By

Instrument Details

Instrument Type	Gravimat SHC502AE
Instrument Make	Erwin Sick
Instrument Serial No.	05218792
Quality No.	C193
Calibration Date	03/07/07
Calibrated By Name	R. Allen

Ambient Conditions

Air Temperature (°C)	19	**
Barometric Pressure (mbar)	998	
Relative Humidity (%)	55	**

Instruments used to undertake calibration

E Type Pitot	UKAS Certificate No. N13497/07	(Qu. No. C136)
Manometer Type FC012	UKAS Certificate No. 03616	(Qu. No. C082)
Manometer Type FC012	UKAS Certificate No. 03617	(Qu. No. C081)
Barometer Type 104	UKAS Certificate No. N3034492P	(Qu. No. C138)
Gallus Dry Gas Meter	UKAS Certificate No. N3027578F	(Qu. No. C125)
RIS Supersal XT	UKAS Certificate No. N3027577E	(Qu. No. C014)

* Not UKAS traceable ** Indication only

Flow and Extraction

The reference pitot was placed in a wind tunnel located at Bretby Business Park. The Gravimat SHC-5 Sampling Probe under test was mounted within the same wind tunnel in close proximity to the reference pitot. The wind tunnel was operated to generate a differential pressure across each pitot, a direct comparison was made. The differential pressures measured were in the region of the calibration points of the reference pitot. Correction factors were applied to the reference pitot and compared to the differential pressure shown for the pitot under test. The extraction system of the unit was operated for a period of one minute.

Volume Flow

A calibrated dry gas meter was connected to the sampling nozzel ot the Gravimat SCH-5. A volume of air is pulled through the sampling system. The measured value shown on the calibrated dry gas meter is then compared to the indicated value on the Gravimat SCH-5 display.

Barometric Pressure

The barometric pressure was measured using a calibrated barometer. The indicated pressure was compared to the Gravimat SHC-5 display.

Temperature

The probe thermocouple was placed in a thermpcouple oven and heated. The temperature was measured using a calibrated thermocouple and temperature indicator. The resultant temperature was compared to the Gravimat SCH-5 display.

Current

A mA current source was injected into the Gravimat SCH-5 using a mA current generator. The injected current was compared to the Gravimat SCH-5 display.

Certificate of Calibration

Date of Issue: 3 July 2007

Bretby Business Park, Ashby Road
Burton-on-Trent, Staffordshire, DE15 0YZ
Tel: 01283 216334 Fax: 01283 550939

[redacted] ES0425
Page 2 of 2

Certified By

Instrument Details

Instrument Type	Gravimat SHC502AE
Instrument Make	Erwin Sick
Instrument Serial No.	05218792
Quality No.	C193
Calibration Date	03/07/07

Ambient Conditions

Air Temperature (°C)	19	**
Barometric Pressure (mbar)	998	
Relative Humidity (%)	55	**
Air Density @ 0°C (kg/m³)	1.277	
Corrected Air Density (kg/m³)	1.1762	

Calibration Details

Flow and Extraction

Applied Pressure (Pa)	Pitot Correction	Applied Pressure Corrected (Pa)	SHC5 p-dyn (Pa)	Pressure Factor	Calculated Velocity (m/s)	SHC5 Velocity (m/s)	Velocity Factor
4.2	0.985	4.1	4.0	1.04	2.652	2.600	1.02
44.8	0.991	44.4	44.5	1.00	8.689	8.700	1.00
101.3	0.992	100.5	100.9	1.00	13.072	13.100	1.00
160.5	0.993	159.4	160.1	1.00	16.462	16.500	1.00
218.0	0.993	216.5	219.1	0.99	19.185	19.300	0.99
Mean (excluding 4.0Pa)				0.99			1.00

Volume Flow

Nominal Flow Rate	Actual Flow Rate	Actual Flow Rate	Orifice Constant
l/min	l/min	m³/hr	
15.000	15.067	0.904	13.00
20.000	20.350	1.221	13.09
25.000	24.980	1.499	13.04
30.000	30.200	1.812	13.02
Instrument Orifice Constant(@1.5m³/hr) =			13.04

Barometric Pressure

Pressure	
Required Value (mbar)	Indicated Value (mbar)
998.0	998.0
1001.0	1001.0
1003.0	1003.0

Temperature

Temperature Input	
Required Value (°C)	Indicated Value (°C)
25.0	25.1
50.0	50.0
100.0	100.0
150.0	150.0
250.0	249.8
300.0	300.0

Current

Current Value	
Required Value (mA)	Indicated Value (mA)
0.0	0.0
5.0	5.0
10.0	10.0
15.0	15.0
20.0	20.0

Time

Time Period mins	Required Value mins	Within Limit
3:00	2:59 → 3:01	Yes
5:00	4:59 → 5:01	Yes
10:00	9:59 → 10:01	Yes