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Stack Emissions Testing Report

Total Particulate Matter
Volatile Organic Compounds
Carbon Monoxide
Oxides of Nitrogen

Magnetto-Topy Wheels (UK) Limited

Coventry

Oven

Sampling Date	**14th July 2004**
Report by	Mark Allison
Job Number	LAB 05277

Contents

Introduction

Magnetto-Topy Wheels (UK) Limited operates a Paint Shop Process at Coventry which is subject to Local Air Pollution Control under the Environmental Protection Act 1990, Part 1.

Scientifics Limited were commissioned by Magnetto-Topy Wheels (UK) Limited to carry out stack emissions testing to determine the release of total particulate matter, volatile organic compounds, carbon monoxide and oxides of nitrogen from the following Plant under normal operating conditions.

Company	Magnetto-Topy Wheels (UK) Limited
Site	Coventry
Stack	Oven
Sampling Date	14th July 2004
Time Test Started	08:45
Time Test Ended	10:15
Abatement Plant	Wet Settler
Operating Conditions	Normal
Materials Processed	Vehicle Wheels
Fuel Type	N/A
Plume Appearance	Slight Steam Plume Visible
Process	'Coating of Metal and Plastic'

Throughout sampling, the operating conditions were maintained as above. Any deviations from the respective methods are noted in the conclusion.

Written Summary

Total Particulate Matter **Passed**

Two particulate tests were performed during continuous operating conditions. The mean sampling time was 24 minutes. The mean particulate concentration was 14 mg/m^3 at reference conditions. This value is below the specified emission limit of 50 mg/m^3.

The tests were performed following the main procedural requirements of BS 3405 : 1983 using a Ströhlein STE 4 isokinetic particulate sampling train.

Volatile Organic Compounds **Failed**

Volatile organic compound concentrations were measured continuously over a 60 minute period, with average values being recorded at 1 minute intervals. The mean volatile organic compound concentration was 480 mg/m^3. This value is above the specified emission limit of 50 mg/m^3.

The sampling was performed in accordance with the main procedural requirements of BS EN 13526:2002 using a heated sampling line and a Signal 3010 MINIFID portable VOC analyser, with detection by FID calibrated against 77.9 ppm propane certified span gas.

Carbon Monoxide **Failed**

Carbon monoxide concentrations were measured continuously over a 60 minute period, with average values being recorded at 1 minute intervals. The mean carbon monoxide concentration was 462 mg/m^3. This value is above the specified emission limit of 100 mg/m^3.

Carbon monoxide concentrations were measured using a heated sampling line and a Testo 339 gas conditioning unit with a Testo 350 combustion gas analyser with detection by electrochemical cells calibrated against certified span gas.

Oxides of Nitrogen **Passed**

Oxides of nitrogen concentrations were measured continuously over a 60 minute period, with average values being recorded at 1 minute intervals. The mean oxides of nitrogen concentration was 22 mg/m^3. This value is below the specified emission limit of 100 mg/m^3.

Oxides of nitrogen concentrations were measured using a heated sampling line and a Testo 339 gas conditioning unit with a Testo 350 combustion gas analyser with detection by electrochemical cells calibrated against certified span gas.

Emissions Summary

Company	Magnetto-Topy Wheels (UK) Limited
Site	Coventry
Stack	Oven
Sampling Date	14th July 2004

Parameter	**Units**	**Result**	**Limit**	**Outcome**
Total Particulate Matter	mg/m^3	14	50	Passed
Particulate Emission Rate	g/hr	33	-	-
Volatile Organic Compounds	mg/m^3	480	50	Failed
VOC Emission Rate	g/hr	1133	-	-
Carbon Monoxide	mg/m^3	462	100	Failed
Carbon Monoxide Emission Rate	g/hr	1092	-	-
Oxides of Nitrogen	mg/m^3	22	100	Passed
Oxides of Nitrogen Emission Rate	g/hr	52	-	-
Stack Gas Temperature	°C	45	-	-
Stack Gas Volumetric Flow Rate (Actual)	m^3/hr	2790	-	-
Stack Gas Volumetric Flow Rate (STP)	m^3/hr	2363	-	-
Stack Gas Velocity	m/s	2.1	-	-

All results are mean values, with particulate concentrations expressed at reference conditions.

Reference conditions for particulate matter and volatile organic compounds are 273K, 101.3kPa, without correction for water vapour content.

Reference conditions for combustion gases are 273K, 101.3kPa, dry gas.

Total Particulate Matter Summary

Sample	Sampling Times	Concentration	Limit
Run 1	09:01 - 09:25	12 mg/m^3	-
Run 2	09:29 - 09:53	16 mg/m^3	-
Mean Particulate Concentration		14 mg/m^3	50 mg/m^3

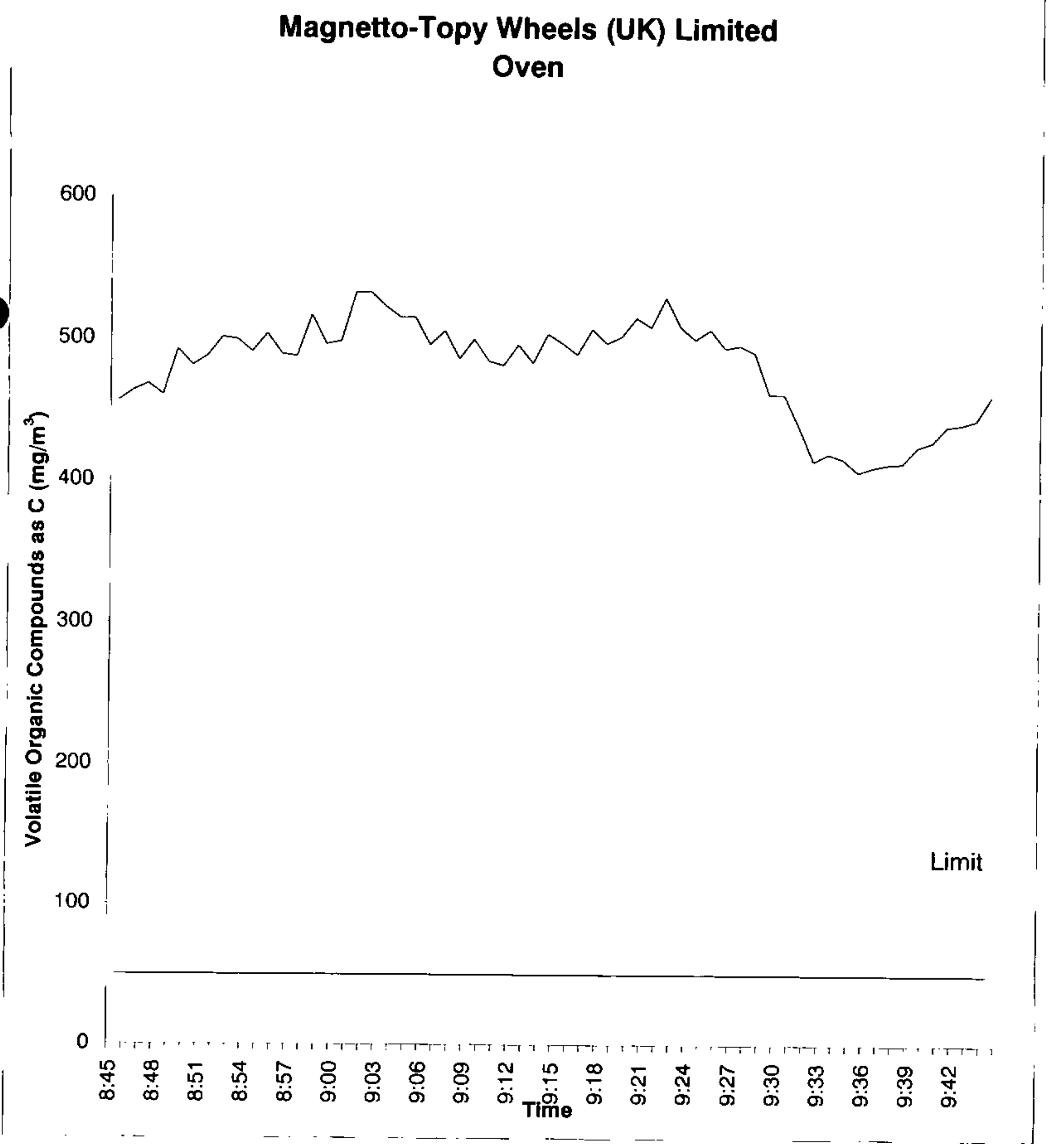
Sample	Sampling Times	Particulate Emission Rate	Ratio of Particulate Emission Rates
Run 1	09:01 - 09:25	0.008 g/s	-
Run 2	09:29 - 09:53	0.010 g/s	-
Mean Particulate Emission Rate		0.009 g/s	1.38 : 1

Reference conditions are 273K, 101.3kPa, without correction for water vapour content.

Volatile Organic Compounds Summary

Company	Magnetto-Topy Wheels (UK) Limited
Site	Coventry
Stack	Oven
Sampling Date	14th July 2004

Sampling Times	Concentration mg/m^3	Limit mg/m^3	Emission Rate g/hr	Limit g/hr
08:45 - 09:44	480	50	1133	-

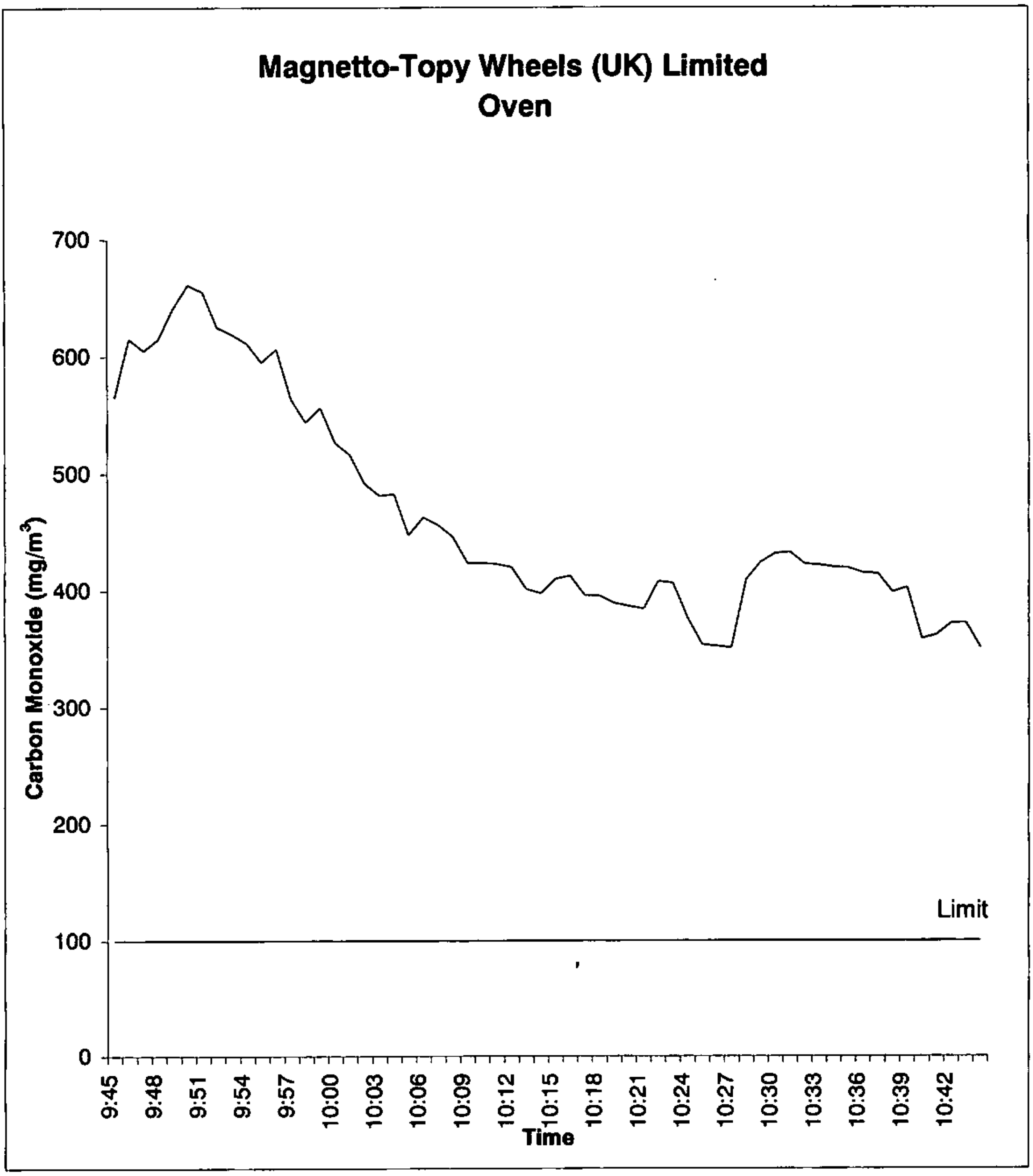


Reference conditions are 273K, 101.3kPa, without correction for water vapour content.

Carbon Monoxide Summary

Company	Magnetto-Topy Wheels (UK) Limited
Site	Coventry
Stack	Oven
Sampling Date	14th July 2004

Sampling Times	Concentration mg/m^3	Limit mg/m^3	Emission Rate g/hr	Limit g/hr
09:45 - 10:44	462	100	1092	-

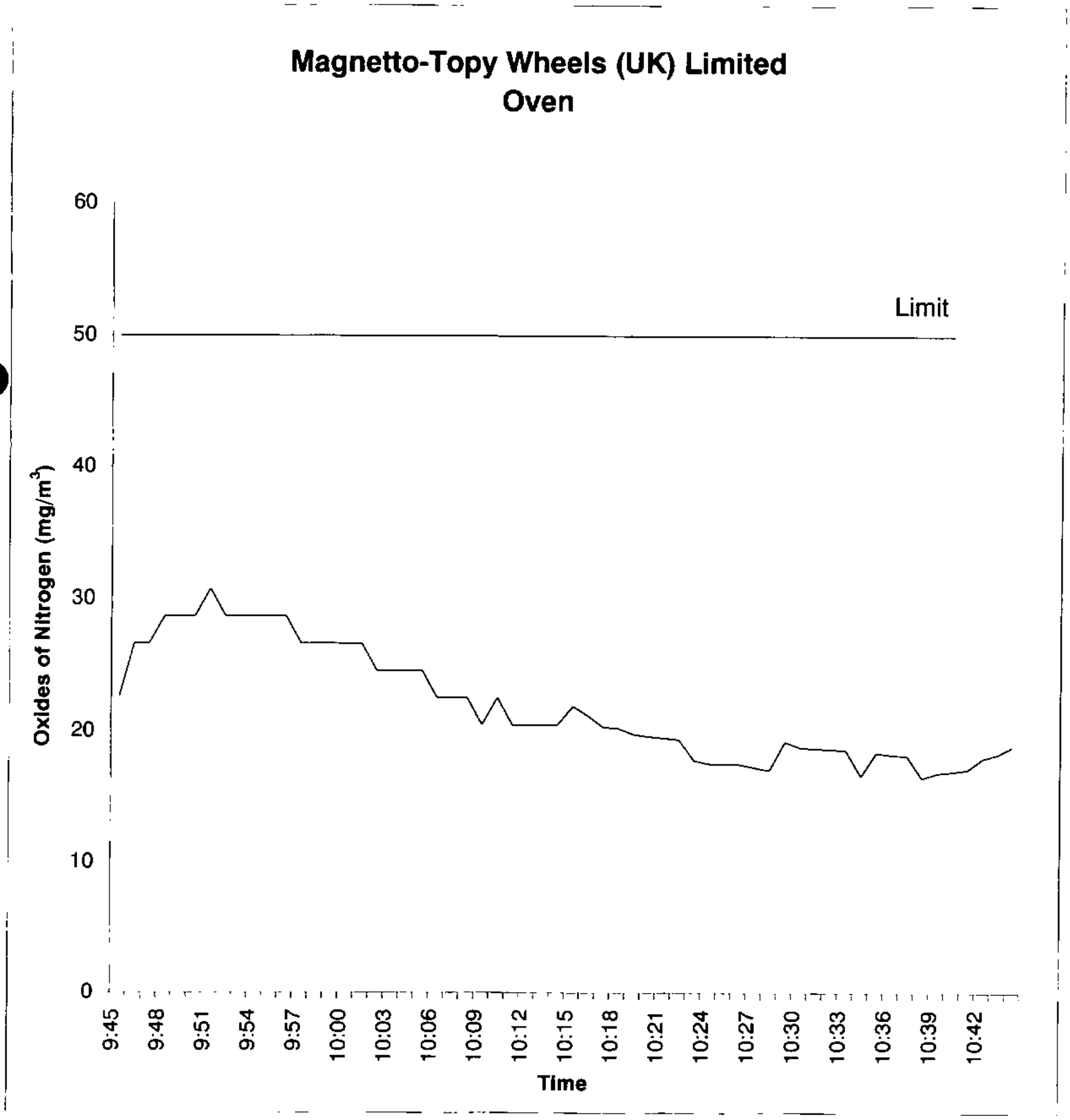


Reference conditions are 273K, 101.3kPa, dry gas.

Oxides of Nitrogen Summary

Company	Magnetto-Topy Wheels (UK) Limited
Site	Coventry
Stack	Oven
Sampling Date	14th July 2004

Sampling Times	Concentration mg/m^3	Limit mg/m^3	Emission Rate g/hr	Limit g/hr
09:45 - 10:44	22	100	52	-



Reference conditions are 273K, 101.3kPa, dry gas.

Calculations - Run 1

1. Stack Gas Velocity (V)

V = $0.075 \times Cp \times \sqrt{\Delta P} \times \sqrt{T}$

V = Velocity (m/s)

Cp = Pitot Tube Calibration Coefficient

ΔP = Mean Differential Pressure (Pa)

T = Mean Temperature (K)

2. Stack Gas Volumetric Flow Rate (Q)

Stack Gas Velocity (V)	2.14 m/s
Stack Depth (d)	0.54 m
Stack Width (W)	0.67 m
Stack Area (A)	0.36 m^2
Stack Temperature (T)	316.50 K
Atmospheric Pressure (P_A)	100.00 kPa
Static Pressure (P_{St})	0.01 kPa
Standard Barometric Pressure (P_B)	101.30 kPa

$Q_{(STP)} = \frac{273}{T} \times \frac{(P_A + P_{St})}{P_B} \times V \times A$ $\qquad Q_{(actual)} = V \times A$

$Q_{(STP)}$ = 0.66 m^3/s **$Q_{(actual)}$ = 0.77 m^3/s**

3. Particulate Mass Emission Rate (M)

No. of Sampling Points (n)	4
Duration at each point (s)	360 s
Nozzle area (a)	79.02 mm^2
Particulate mass (m)	0.0024 g
Stack Area (A)	0.36 m^2

$M = \frac{(A \times m) \times 10^6}{(n \times a \times s)}$ = 7.6E-03 g/s

M = 0.008 g/s

4. Particulate Concentration (C) at 273K, 101.3kPa

$C = (M / Q_{(STP)}) \times 1000$

C = 11.59 mg/m^3

Calculations - Run 2

1. Stack Gas Velocity (V)

$V = 0.075 \times Cp \times \sqrt{\Delta P} \times \sqrt{T}$

V = Velocity (m/s)

Cp = Pitot Tube Calibration Coefficient

ΔP = Mean Differential Pressure (Pa)

T = Mean Temperature (K)

2. Stack Gas Volumetric Flow Rate (Q)

Stack Gas Velocity (V)	2.15 m/s
Stack Depth (d)	0.54 m
Stack Width (W)	0.67 m
Stack Area (A)	0.36 m^2
Stack Temperature (T)	320.00 K
Atmospheric Pressure (P_A)	100.00 kPa
Static Pressure (P_{St})	0.01 kPa
Standard Barometric Pressure (P_B)	101.30 kPa

$Q_{(STP)} = \frac{273}{T} \times \frac{(P_A + P_{St})}{P_B} \times V \times A$ $\qquad Q_{(actual)} = V \times A$

$Q_{(STP)}$ = 0.65 m^3/s $\qquad$ **$Q_{(actual)}$ = 0.78 m^3/s**

3. Particulate Mass Emission Rate (M)

No. of Sampling Points (n)	4
Duration at each point (s)	360 s
Nozzle area (a)	79.02 mm^2
Particulate mass (m)	0.0033 g
Stack Area (A)	0.36 m^2

$M = \frac{(A \times m)}{(n \times a \times s)} \times 10^6 \quad = \quad 1.0E-02$ g/s

M = 0.010 g/s

4. Particulate Concentration (C) at 273K, 101.3 kPa

$C = (M / Q_{(STP)}) \times 1000$

C = 16.03 mg/m^3

On Site Isokinetic Data Sheet

Preliminary Stack Survey		Sampling Line A		Sampling Line B	
Traverse Point	Distance in Stack (m)	Dynamic Pressure (Pa)	Temperature (°C)	Dynamic Pressure (Pa)	Temperature (°C)
1	0.03	3	41	-	-
2	0.10	4	41	-	-
3	0.17	4	41	-	-
4	0.23	5	41	-	-
5	0.30	5	41	-	-
6	0.37	5	41	-	-
7	0.44	5	41	-	-
8	0.50	5	41	-	-
9	0.57	4	41	-	-
10	0.64	4	41	-	-
Mean	-	4	41	-	-

Lowest Dynamic Pressure (any line) 3 Ratio of Above 1.67 : 1

Highest Dynamic Pressure (any line) 5 (Highest permitted ratio 9:1)

Temperature Range permitted for any point is between 10 and 72 °C.

Run 1	Sampling Time (mins)		24	Nozzle size used (mm)		10.03
Sampling Point	Dynamic Pressure (Pa)		Temperature (°C)		Velocity (m/s)		Flowmeter set at (m^3/hr)
	Initial	Final	Initial	Final	Initial	Final	
1	3	3	41	46	1.82	1.84	0.48
2	5	4	41	46	2.35	2.12	0.62
3	5	5	41	46	2.35	2.37	0.62
4	4	4	41	46	2.11	2.12	0.56
Mean	4	4	41	46	2.16	2.11	0.57

Difference between Initial Velocity and Final Velocity = -2.15 % (Limit permitted is ± 5%)

Start Filter Weight = 0.1199 g Sample Weight = 0.0024 g

End Filter Weight = 0.1223 g Sample as % of Filter Weight = 2.00 %

Run 2		Sampling Time (mins)		24	Nozzle size used (mm)		10.03
Sampling Point	Dynamic Pressure (Pa)		Temperature (°C)		Velocity (m/s)		Flowmeter set at (m^3/hr)
	Initial	Final	Initial	Final	Initial	Final	
1	3	3	46	48	1.84	1.84	0.48
2	4	5	46	48	2.12	2.38	0.55
3	5	5	46	48	2.37	2.38	0.62
4	4	4	46	48	2.12	2.13	0.55
Mean	4	4	46	48	2.11	2.18	0.55

Difference between Initial Velocity and Final Velocity = 3.18 % (Limit permitted is ± 5%)

Start Filter Weight = 0.1186 g Sample Weight = 0.0033 g

End Filter Weight = 0.1219 g Sample as % of Filter Weight = 2.78 %

Volatile Organic Compounds Emissions Data

Time	VOC mg/m^3	Time	VOC mg/m^3
08:45	456	09:15	497
08:46	463	09:16	489
08:47	468	09:17	507
08:48	460	09:18	497
08:49	492	09:19	502
08:50	481	09:20	515
08:51	487	09:21	508
08:52	501	09:22	529
08:53	500	09:23	509
08:54	491	09:24	500
08:55	504	09:25	507
08:56	489	09:26	494
08:57	487	09:27	496
08:58	517	09:28	491
08:59	496	09:29	462
09:00	498	09:30	462
09:01	533	09:31	439
09:02	533	09:32	414
09:03	523	09:33	420
09:04	515	09:34	416
09:05	515	09:35	407
09:06	496	09:36	410
09:07	506	09:37	413
09:08	486	09:38	413
09:09	500	09:39	425
09:10	484	09:40	428
09:11	481	09:41	439
09:12	496	09:42	441
09:13	483	09:43	444
09:14	504	09:44	461
		Mean	480

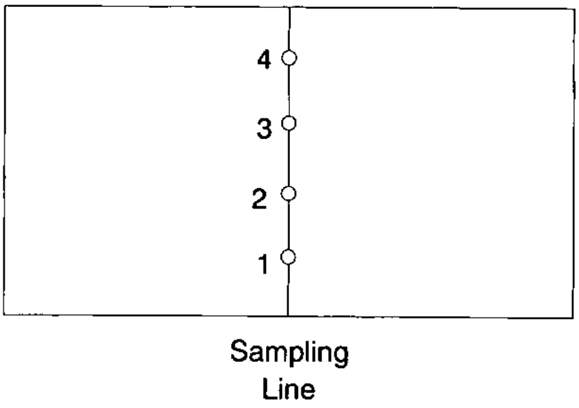
Reference conditions are 273K, 101.3kPa, without correction for water vapour content.

Combustion Gases Emissions Data

Time	CO mg/m^3	NO$_x$ mg/m^3	Time	CO mg/m^3	NO$_x$ mg/m^3
09:45	565	23	10:15	410	22
09:46	615	27	10:16	412	21
09:47	605	27	10:17	396	20
09:48	615	29	10:18	395	20
09:49	641	29	10:19	389	20
09:50	661	29	10:20	386	20
09:51	655	31	10:21	384	20
09:52	625	29	10:22	408	19
09:53	619	29	10:23	406	18
09:54	611	29	10:24	376	18
09:55	595	29	10:25	353	18
09:56	606	29	10:26	352	18
09:57	564	27	10:27	351	17
09:58	544	27	10:28	409	17
09:59	556	27	10:29	424	19
10:00	526	27	10:30	431	19
10:01	516	27	10:31	432	19
10:02	491	25	10:32	423	19
10:03	481	25	10:33	422	19
10:04	483	25	10:34	420	17
10:05	448	25	10:35	419	18
10:06	463	23	10:36	415	18
10:07	456	23	10:37	414	18
10:08	446	23	10:38	398	16
10:09	424	21	10:39	402	17
10:10	424	23	10:40	358	17
10:11	423	21	10:41	362	17
10:12	420	21	10:42	372	18
10:13	401	21	10:43	372	18
10:14	398	21	10:44	350	19
			Mean	462	22

Reference conditions are 273K, 101.3kPa, dry gas.

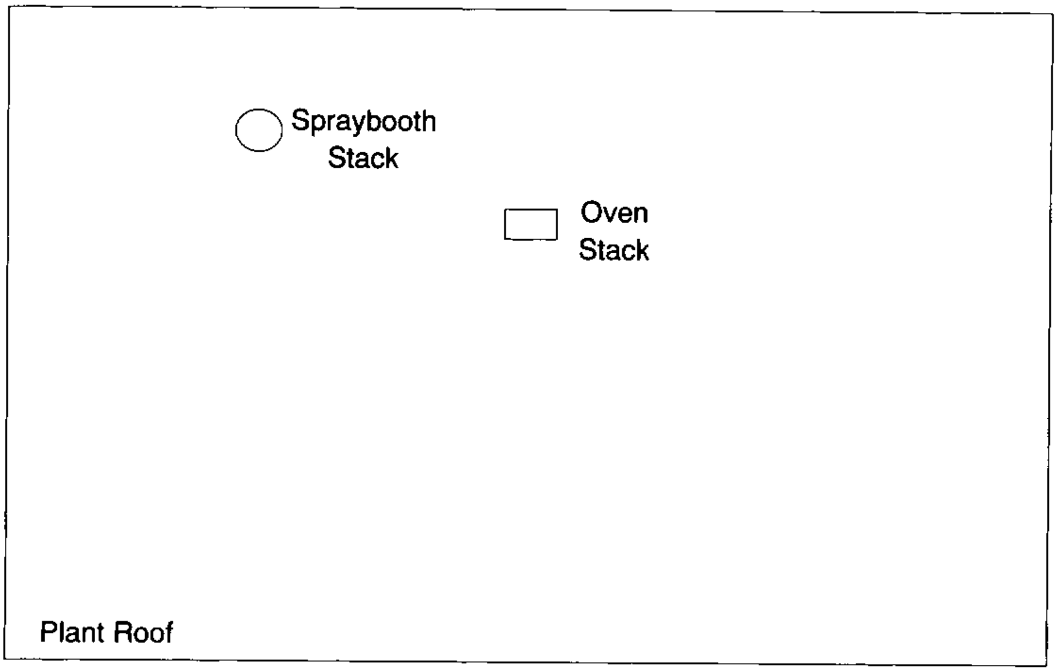
Stack Diagram



Stack Depth (d) = 0.54 m
Stack Width (W) = 0.67 m
Stack Area (A) = 0.36 m^2

Sampling Point	Distance as a % of (D)	Distance in m
1	12.5	0.07
2	37.5	0.20
3	62.5	0.34
4	87.5	0.47

Plant Layout



Total Particulate Matter Sampling Methodology

Job Preparation

A pre-site survey must first be undertaken to obtain the following information. Client details (full address & contact names), description of stack (name & location), sampling platform / access (Permanent - platform of adequate size & load capability, kick boards, hand & middle rails, free from debris, good drainage, fixed ladders with hoops and chain. Temporary - adequate size & load capability, stabilising legs, valid inspection tag, kick boards, hand & middle rails. Both types of platform must have a secure anchorage point to fix pulley system) hazards (dust, noise, temperature, gases/vapours, vibration, light, moving machinery, electricity etc) power supply and location, additional PPE required (high temperature gloves/overalls, PPE).

The Strohlein STE 4, isokinetic particulate measurement equipment, is fully inspected prior to use and its calibration status observed. This includes:

Pitot Tube - All pitot tubes are physically checked for damage, paying particular attention to the inlet holes. All dirt and blockages are removed.

Micromanometer - Digital differential pressure meters are used capable of measuring pressure in the range 0 Pa to 2250 Pa with a sensitivity of ±1 Pa. These instruments are checked for obvious physical damage, battery life tested and calibrated status observed.

Thermocouple - Temperature is measured using k type thermocouples. Each thermocouple is inspected for obvious damage and its calibration status observed. Digital temperature meters are used in conjunction with K type thermocouples. These are also checked for obvious physical damage and their battery life tested.

Nozzles - All nozzles used have been constructed in accordance BS 3405 : 1983, section 5.3.2. Each nozzle is physically checked for damage and removed if necessary. The nozzle calibration status is observed.

Flowmeter - The flowmeter is checked for blockages and obvious physical damage. Its calibration status is also observed.

Balance - A Mettler Toledo balance is used to weigh filters. The balance is positioned on a solid base located in a specially built weighing room. The balance is serviced and calibrated routinely each year by the manufacturer and also checked daily with in-house check weights.

Rope Kit - All lifting tackle i.e. rope, pulleys, karabiners, brakes and slings are physically checked for cuts and contamination.

Should the calibration certainty of any of the above equipment be in question, that item of equipment must be recalibrated and replaced if necessary.

Filter Selection and Preparation

Stack conditions can vary greatly for temperature, moisture, acidity, low and heavy particulate loading. Following the pre-site survey, the stack gas condition should be known and the appropriate filter can be selected and prepared as described below.

Filter mediums - glass wool, quartz wool, Gelman Sciences A/C Glass Fibre filter papers, Gelman Sciences Low Ash PVC membrane filter papers, Schleicher & Schuell Glass Fibre Thimbles or Schleicher & Schuell Quartz Thimbles.

Filters are prepared by drying in an oven at 160°C for a period of one hour and then placed to cool in a dessicator. The filters are weighed accurately on a 4-figure balance and then placed in clean individual petri dishes and transported to site in a filter storage box. Spare filters are also prepared to allow for accidents and to obtain blank values.

Sampling Procedure

Suitability of Sampling Location

Before sampling can commence, a preliminary velocity and temperature survey must be undertaken along the two sampling lines at ten equally spaced points excluding the region within 5% of the effective flue diameter from the wall. The stack diameter is measured using a steel rod. If the ratio of the highest to lowest dynamic pressures exceeds 9:1 or if the ratio of the highest to lowest gas velocities exceeds 3:1, another sampling plane should be used. Sampling is undertaken from either four or eight sampling points.

Four sampling points are used when the ratio of the highest to lowest dynamic pressures is less than 4:1 and eight sampling points when the ratio of highest to lowest dynamic pressures exceeds 4:1 but less than 9:1 or the stack area exceeds 2.5 m^2. Temperature is also measured at ten equally spaced points along the sampling lines and an average temperature calculated. Should the temperature at any of the sampling points differ by more than + 10% from that of the average temperature, then that point must not be used.

The required number of sampling points can now be calculated using the following:

4 point sampling, circular stacks: 0.15 x D and 0.85 x D.

4 point sampling, square stacks: 0.25 x D and 0.75 x D.
8 point sampling, circular stacks: 0.065 x D, 0.25 x D, 0.75 x D and 0.935 x D.
8 point sampling, square stacks: 0.125 x D, 0.375 x D, 0.625 x D and 0.875 x D.

Leak Checks

A leak check should be undertaken before and after the iso-kinetic sampling is carried out. This is to make sure that all suction is taken at the sampling nozzle.

Sampling

Once the iso-kinetic sampling flow rates have been calculated, the probe is inserted into the stack at 90° to the stack gas flow, as not to impinge any particulate matter on to the filter media prior to sampling. Allow the filter head and probe to attain the stack gas temperature. Start the suction device, and set the flowmeter to the correct suction rate for isokinetic sampling. At the same time turn the nozzle into flow and start the timing device.

Duration of Sampling Time

Duration of sampling time depends on :

(a) ensuring adequate quantities of particulate matter on the filter for weighing (> 0.3 % of the filter weight).
(b) whether cumulative or incremental sampling is undertaken.
(c) the number of sampling points i.e. either 4 or 8 point sampling.
(d) the continuity of plant operation.

Cumulative Sampling

After the first sample is taken from the first sampling position the control valve is closed simultaneously turning the sampling probe 90° to the stack gas flow, moving the probe to the next sample position. This process should be repeated until all the sample points have been used once.

Repeat Velocity and Temperature Readings

At each of the sampling points repeat the readings for the stack gas flow rate and stack gas temperatures. Calculate the new iso-kinetic sampling flow rates. If the stack gas velocity is more than ± 5% from the initial readings the test result shall not be regarded as having the required accuracy. The new temperature reading should not exceed the permitted range calculated in the preliminary survey. i.e. it should be within ± 10% of the original mean temperature.

N.B. The filter head should be cleaned and the particulate matter added to the particulate matter on the filter.
The Sampling procedure should be repeated to obtain a duplicate sample, the ratio of the two particulate emission rates should not exceed 1.5 : 1.

Weighing of Sample

The used filter should be placed in an oven at 180°C and dried thoroughly, cooled and equilibrated in a desiccator and weighed as quickly as possible so as to avoid any errors due to moisture absorption onto the filter. The gross weight of the filter should be measured to within ± 0.1 mg. The filter weight and any residual particulate matter from the filter head can then be used in the final report to calculate the particulate concentration.

Volatile Organic Compounds Sampling Methodology

The Signal 3010 MINIFID Portable Heated Total Hydrocarbon Analyser uses Flame Ionisation to detect total organic carbon in a gas stream.

Checks Carried Out before Arrival On Site

The FID analyser is set up and is tested. The following are checked; the furnace and sample line temperatures, the zero and span gas calibration and the operation of the data logger.

On Site Sampling Procedure

The FID and sample line are switched on and allowed to reach operational temperature. The analyser will take 20 minutes to reach its operational temperature of 180°C. The sample line is heated to approximately 180°C to avoid VOCs condensing in the line. When the components have reached the correct operating temperature the fuel and span gas valves are opened and the FID is ignited.

The FID will take about 20 minutes before it stabilises and gives a zero ppm reading. The zero gas is fed into the FID and the zero set. The span gas is fed into the FID and the instrument adjusted to read the certified span gas value. The zero gas is fed into the FID once more to check that the reading returns to zero, if it does not, then these steps are repeated.

The probe, with a particulate filter, is then inserted into the stack, and the data logger activated.

The data logger can be programmed to log results over a 1, 5, 10 etc minute period. The results displayed and logged are the volume concentration of propane in ppm, which are converted to mg/m³ by the following calculations:

$$C_m = C_v \frac{36}{22.4}$$

where C_m is the TOC concentration in mg/m³ (273 K; 101300 Pa)

C_v is the volume concentration of propane in ppm (by volume)

Combustion Gases Sampling Methodology

The Testoterm Combustion Efficiency Analyser is a portable instrument capable of measuring oxygen, carbon monoxide, carbon dioxide, oxides of nitrogen, sulphur dioxide, stack temperature, date and time of test. It is designed to measure boiler emissions and has over 70 pre-programmed fuel types including natural gas, light and heavy oil.

Procedure Before Arrival On Site

The water trap, particulate filter and probe are cleaned, and the battery recharged.
The data logger is cleared and the sulphur dioxide filter changed if necessary.
The analyser is recalibrated every hour to prevent any saturation of the detection cells.

On site sampling procedure

The analyser is calibrated in fresh air and the fuel type is selected.
The probe is positioned into the centre of the stack and the access hole is plugged.
The analyser is programmed to record to the data logger and as a printout.
The analyser is recalibrated every hour to prevent any saturation of the detection cells.

On return to Scientifics Ltd

If the data logger was used, the information is downloaded onto a PC.
The analyser is then re-calibrated against bottled gas of a known concentration.

Operational Range

The NO and NO_2 electrochemical cells have a resolution of 1 ppm with an accuracy Of +/- 5 ppm at concentrations of less than 100 ppm and +/- 5 % at concentrations greater than 100 ppm.

The oxygen sensor is a self powered, diffusion limited, metal air battery fuel cell. It has a resolution of 0.1 % with an accuracy of 0.1 %.

The carbon monoxide cell has a resolution of 1 ppm with an accuracy of +/- 20 ppm at concentrations less than 400 ppm, +/- 5 % at concentrations less than 2000 ppm and +/- 10 % at concentrations greater than 2000 ppm.

Carbon dioxide is displayed as a percentage and is calculated from the oxygen content and fuel carbon content, and has an accuracy of +/- 0.3 %.

All sensors and electrochemical cells have filters and cross sensitivity compensation data for more accurate measurements.

The analyser measures flue gas temperature via the stainless steel probe/ thermocouple within the range 0 to 1200 °C.

Quality Assurance Checklist

Velocity Measurements:

Were water droplets present ?	No
Direction of gas flow within ± 20° of stack axis.	Yes
Dynamic pressures > 5 Pa at all sampling points.	No
Ratio of highest to lowest dynamic pressures < 9 : 1.	Yes

Sampling:

Sampling plane was correctly positioned.	Yes
Area of sampling apparatus was < 10% of stack area.	Yes
Sampling was from centres of equal areas.	Yes
Sampling at each point not less than 3 minutes.	Yes
Nozzle was facing directly upstream to within ± 10°.	Yes
Leak check performed before and after each run and passed.	Yes

Sample Handling:

Minimum weight of samples collected > 0.3% of filter weights	Yes
Samples achieved stable weights.	Yes
Particulate samples stored for 3 months.	Yes

QA Procedures:

Isokinetic data sheet completed and signed off by Team Leader.	Yes
Report saved electronically onto Scientifics server.	Yes
Raw data and hard copy of report filed together.	Yes

Environmental Monitoring Team

Environmental Team Leader	Mark Allison BSc (Hons) Environmental and Resource Science MCERTS Level 1 - MM 03 162
Environmental Technician	Matthew Pendlebury BSc (Hons) Physics
Report by	Mark Allison Team Leader

Checked and Authorised By [redacted] Signed

James Harmer Print Name

26th July 2004 Dated

Team Leader Business Title

Deviations from BS 3405 : 1983

Total Particulate Matter testing was fully in accordance with BS 3405 : 1983, apart from the fact that only 1 sampling line could be used. However, 4 sampling points were used on the 1 line, instead of just 2.

Conclusion

The results of this test demonstrate that under normal operating conditions, this Plant is being operated in compliance with the total particulate matter and Oxides of Nitrogen emission limits specified in PG 6/23 (04).

However, the results also show that this Plant is emitting levels of Volatile Organic Compounds and Carbon Monoxide in excess of the limits set out in PG 6/23 (04).