

DUST



FLOW

PCME



COPIES TO :-

M. DOUGLAS

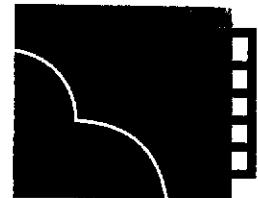
I. GAFFNEY

C. WATKIN (HUNTINGDONSHIRE DISTRICT COUNCIL)

N. DURHAM



Certificate No. 9389



PCME

David Rees
VIP Heinke
St Peters Road
Huntingdon
Cambridgeshire
PE18 7DJ

09 September 1999

OUR REF: J904022

YOUR REF: 9801375

Dear Mr Rees

The site at VIP Heinke, Huntingdon, was visited on 17th August, 1999 in order to carry out particulate emission tests on the Carter Midac bag filter exhaust.

The tests were performed in order to determine the calibration of the DT770 continuous emission monitor installed on the plant.

The extracted air was sampled isokinetically and in accordance with BS 3405:1983.

The mean particulate concentration during the test period was found to be:-

0.042 mg/m³

The instrument calibration settings are detailed in the report.

The instrument should be recalibrated no later than 17th August 2000.

Yours sincerely

Len Moss
TECHNICAL SUPPORT MANAGER

Yelland Environmental Services

L.M. & W.P.M. Yelland
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St. Austell Cornwall PL25 3SG

Tel/Fax: 01726 815065
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Measurement of Particulate Emissions
Respirable Dust Monitoring
L.E.V.E. Plant Test and Inspection
Noise Surveys

**Environmental Protection Act, Part 1
Air Pollution Control**

PARTICULATE EMISSION TEST

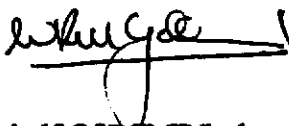
on

**CARBON BLACK PLANT
CARTER MIDAC BAG FILTER EXHAUST**

for

**VIP HEINKE
ST. PETERS ROAD
HUNTINGDON
CAMBRIDGESHIRE
PE18 7DJ**

Tested By:



On Behalf Of PCME Ltd.

Date Of Test: 17.08.99



V.A.T. Registration No. 557 4873 95

Serving Industry and the Environment

OBJECTIVE

To assess the particulate emission concentration in the exhaust gases.

As part of the calibration service offered by PCME in support of the continuous monitor installed in the emission point.

METHOD

The work carried out was, as far as was reasonably practical, in accordance with BS3405:1983 ("Measurement of particulate emission including grit and dust").

Monitoring of total particulates involved isokinetic sampling using the BCURA test apparatus.

Isokinetic flow means that sample gases laden with particulates are drawn off at the same velocity as the free stream velocity in the flue. Isokinetic sampling thus avoids possible inertial effects of particulates approaching the vicinity of the inlet nozzle which may result in significant error.

Prior to sampling a pressure and temperature survey, using a pitot static tube, a micromanometer, a digital thermometer and a nickel-chromium/nickel-aluminium thermocouple, was carried out to check whether the flow conditions met with BS 3405:1983 requirements.

The BCURA sampling equipment used was designed to permit the measurement of soot and fume, dust, grit or total solids. The solids collecting device comprises a small cyclone and a filter, the cyclone collects both dust and grit whilst the filter collects the finer particles which pass through the cyclone.

With the BCURA cyclone probe clamped into the test port and the sampling nozzle facing upstream, flue gases are drawn through the cyclone/filter by means of a suction fan. The rate of flow is regulated to give the required pressure drop across the cyclone necessary for isokinetic sampling conditions. Sampling is for a planned duration following which the flow is shut off, the cyclone probe removed from the flue and the amount of particulate found by weighing the contents of the hopper, and of the filter. The procedure is repeated at a pre-determined number of sampling points across the test plane and from this the mass flow is calculated.

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TABLE A**Process Conditions**

Arrestment Plant:	Bag filter
Particulate Type:	Carbon black
Plant Loading:	Continuous
Appearance of plume:	No visible discharge
Weather Conditions:	Overcast with a light south westerly wind.

TABLE B**Results**

	Test Run No. 1.	Test Run No. 2.	Average
Time of Test:	11.43 - 12.23	12.30 - 13.10	
Sampling Duration: (mins)	40	40	
Gas Temperature (°C)	25	25	25
Mean Velocity at Sampling Points: (m/s)	18.75	18.79	18.77
Gas Flow Rate at STP (1): m ³ /s)	2.85	2.86	2.86
Particulate Loading at STP (1): mg/m ³)	0.04	0.05	0.04
Particulate at Normalised Conditions (2): mg/m ³)	—	—	—

(1) Particulate stated at 273K, 101.3kPa without correction for water vapour.

(2) State normalised conditions (eg 11% O₂ dry etc).

SAMPLING CONDITIONS

Run No.	Traverse Sample Point No.	Pitot Velocity Pressure Pa	Cyclone Differential Pressure kPa	Nozzle Area mm ²	Pot No.	Filter No.
1	A1(0.15D)	213	3.8	200	25	1
	A2(0.85D)	206	3.7	200	25	1
	B1(0.15D)	211	3.8	200	25	1
	B2(0.85D)	202	3.6	200	25	1
2	A1(0.15D)	210	3.8	200	6	2
	A2(0.85D)	213	3.8	200	6	2
	B1(0.15D)	208	3.8	200	6	2
	B2(0.85D)	205	3.7	200	6	2

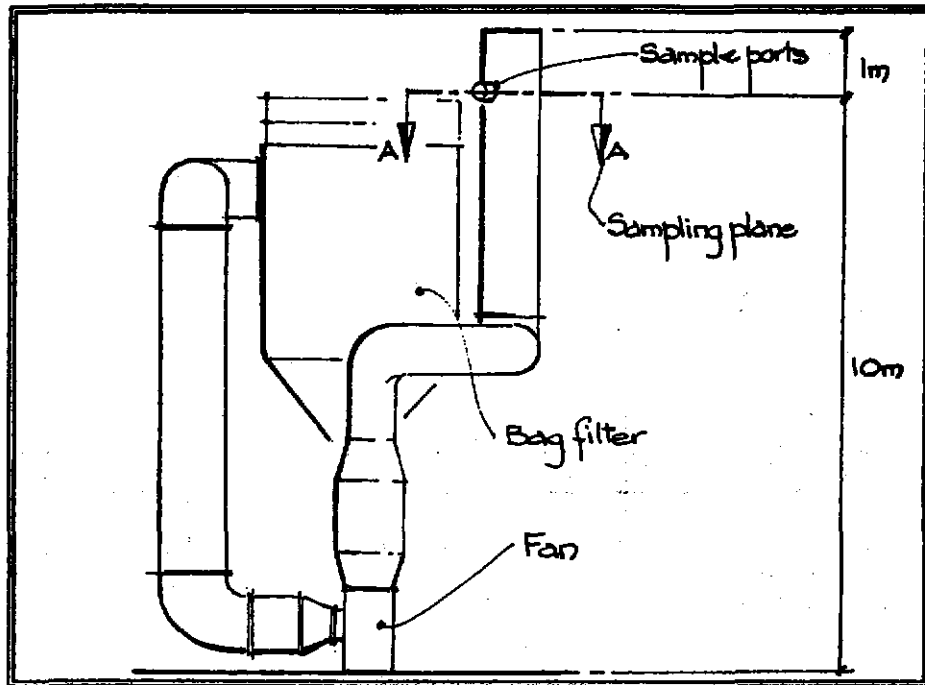
WEIGHING RESULTS

Sample Run No.1	Ref No.	Weights gms			Sample time at each point (mins)	% weight on filter
		Before	After	Collected		
Pot	25	48.1023	48.1026	0.0003	10	
Filter	1	0.1255	0.1255	0.0000	10	
Total weight =				0.0003		0.0%
Sample Run No.2	Ref No.	Weights gms			Sample time at each point (mins)	
		Before	After	Collected		
Pot	6	45.6612	45.6615	0.0003	10	
Filter	2	0.1259	0.1260	0.0001	10	
Total weight =				0.0004		25.0%

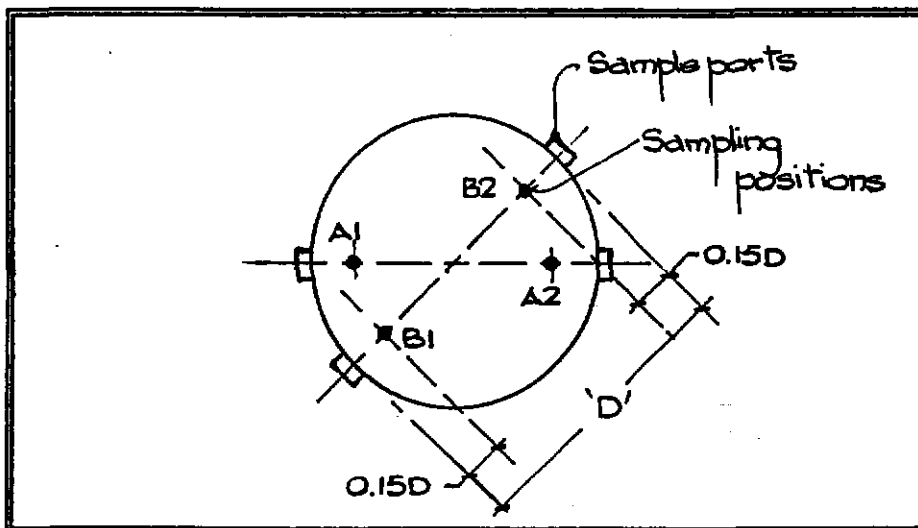
APPENDIX A

Sampling Test Data

1) Plant layout showing position of sample ports



2) Section of duct at sample plane A-A



INSTRUMENT CALIBRATION REPORT

Company: VIP HEINKE

Site Address: HUNTINGDON

Date of Sampling: 17. 8. 99

Job No. J904022

Plant Identification: FILTER EXHAUST DISC/File Reference: _____

Test Carried out by: YELLAND

Instrument Settings

Instrument: DT770

Channel #: 1

During Sample

DT-770/SC-600

DT-200

Instrument Checks: Pass/Fail

Correct Time: _____

Sensitivity: MH

Old Cal factor: 0.627

(in use during sampling)

Flow Compensation: ON/OFF

O₂ Compensation: ON/OFF

Coarse Gain Position: _____

Fine Gain Display: _____

Filter Position: _____

Coarse Gain: _____

Fine Gain: _____

Instrument Results

Run	Start Time	Finish Time	Duration (MINS)	Instrument Average (Y)	Instrument Max	Dust Conc mg/m ³ (X)
1.	11.43	12.23	40	0.027	0.05	0.036
2.	12.30	13.10	40	0.029	0.17	0.048
3.						
4.						
Time Weighted Average	---	---	---	0.028	---	0.042

Calibration Calculations

X (from Iso test) = 0.042

Y (Inst response) = 0.028

Scaling factor = $\frac{X}{Y} = \frac{0.042}{0.028} = 1.50$

~~Gain~~
New Cal Factor = scaling factor x old Cal Factor
= 1.50 x 0.627 = 0.941

Instrument Settings for Calibration

DT-770/SC-600

DT-200

Cal Factor: 0.941

CG Position: _____

FG Display: _____

Coarse Gain: _____

Fine Gain: _____

BARRY T. FISHER

&

ASSOCIATES

Health, Safety and
Environmental Consultants

4 Alcester Close, Tunstall,
Stoke-on-Trent, ST6 6QB

Telephone & Fax: 01782 - 837526

**REPORT NO. 99013
MEASUREMENT OF
TOTAL PARTICULATE AND
VOC EMISSIONS
AT
VIP - HEINKE
HUNTINGDON
AUGUST 1999**

Client: VIP - HEINKE.
St Peter's Road
Huntingdon
Cambs.
PE18 7DJ

For the attention of Mr D Rees

Dates of Field Work: 16, 17, 19 August 1999

Date of Report: 20 August 1999

Barry Thomas Fisher MSc, Dip Occ Hyg, MBIOH

Registered Professional Hygienist

Member of the British Institute of Occupational Hygienists

Member of the British Occupational Hygiene Society

1 INTRODUCTION

At the request of Mr D Rees, various stack emissions were monitored for compliance with EPA requirements, i.e. for compliance with requirements of Process Guidance Note PG6/28 - Rubber Processes.

2 METHODOLOGY UTILISED

2.1 Total Particulate Matter - Stack emissions

The emissions from the exhaust stacks were measured by means of isokinetic sampling, carried out according to the main procedural requirements of BS 3405:1983 as specified in Secretary of State's Guidance Note PG6/28(92) - Rubber Processes.

Wherever possible the procedure followed was as follows. Prior to carrying out the isokinetic sampling it was necessary to establish the airflow and temperature profiles along two sampling lines across the stack.

The airflow profile was established by two six-point traverses arranged at right angles across the stack using a pitot static tube connected to a manometer.

The temperature profile was similarly measured using a digital K-Type thermometer.

All measurements were taken in a straight section of the discharge duct away from any obstructions that might cause disturbances in the airflow pattern etc.

The girth of the stack was measured and the internal diameter of the stack was calculated. The volume air flow was calculated from the velocity measurements obtained above.

Once the airflow and temperature profiles had been established as suitable for isokinetic sampling, the air velocities were then measured at a further four positions located at the centres of four equal areas as required by BS 3405: 1983.

A sample was then taken at each of these four locations by drawing air through a suitably sized nozzle, conforming to the requirements of BS 3405: 1983, and collecting the particulate matter on a pre-weighed glass fibre filter (Whatman GF/A); the flow rates being adjusted to provide isokinetic sampling to match the air velocities already determined at each of these locations in the stack.

This procedure was then repeated to obtain a duplicate sample of the emissions.

After sampling the exposed filters were transported back to the laboratory and allowed to equilibrate for a period of 24 hours to allow time for evaporation of any adsorbed moisture before being re-weighed.

The total particulate matter in the emissions was then calculated from the results obtained.

On some of the stacks the skew pattern of the airflow within the duct made it impossible to obtain an accurate indication of the air velocity. It was found that the airflow was inclined in the region of 15-20° from the vertical indicating a swirling pattern of airflow within the duct. Therefore in these circumstances there was no alternative but to measure the airflow by angling the Pitot tube to the same extent followed by isokinetic sampling with the sampling probe similarly inclined.

In the case of system No. 75, the stack terminates just through the roof, the upper three metres of stack having been removed prior to my previous survey. Therefore it was not possible to carry out any particulate measurements as there was no suitable sampling position. In my previous survey I recommended that one of the spare 300 mm diameter redundant stacks lying on the roof should be permanently attached to the existing stack to allow better dispersion of the fume without re-entrainment back into the workshop through open roof vents etc. However, this was not done and the spare stacks have been removed from the roof, albeit that there is still some suitable spare ducting on the small roof above the engineering workshop which could be used for this purpose..

2.2 Volatile Organic Compounds (VOC's)

A portable Flame Ionisation Detector (FID), Research Engineers - type GAS-TECH, was used to measure the VOC content of the emissions.

Before use the instrument had been calibrated using methane. The results were calculated using the appropriate response factor for the compound being measured as specified by the manufacturers of the instrument.

In the case of rubber fume, the results are expressed in terms of methane-equivalent as the composition of the fume is unknown.

3 RESULTS

3.1 The results of the various samples are given in the tables.

4 COMMENTS ON THE RESULTS

The limits set out for the emissions in PG6/28 are as follows:

Total Particulate Matter from the storage, handling or mixing of carbon black (applicable to stacks 43 & 44 only)	10 mg/m ³
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Total Particulate Matter other than from the storage, handling or mixing of carbon black	50 mg/m ³
---	----------------------

Volatile Organic Compounds (as total carbon excluding particulate matter)	50 mg/m ³
---	----------------------

All of the emissions measured were found to be well below the relevant limits in respect to Total Particulate Matter.

All of the rubber fume emissions were found to be well below the VOC emission limit.

On this occasion, the spray booth emissions were found to be in excess of the VOC limit; the concentrations being emitted were found to be in the range of 15 - 353 mg C/m³, with an average value of 149 mg C/m³.

Also, the emissions from the Mindon oven adjacent to the spray booth were found to exceed the VOC limit; the concentrations being emitted were found to be in the range of 13 - 211 mg C/m³, with an average value of 67 mg C/m³.

CONCLUSIONS

The results of the Total Particulate Matter measurements have shown that the emissions, from all of the nine stacks measured, comply with the current limits in respect of PG6/28.

On this occasion, the results from the 32 stacks measured for rubber fume VOC's have shown that all of these emissions comply with the current limits in respect of PG6/28.

However, the VOC emissions from the metal preparation posts were found to be in excess of the VOC limit on this occasion. If no suitable water based alternative metal bonding agent can be utilised, then based upon these results, the addition of some suitable abatement equipment is required to control these emissions.

I would also recommend that a three metre duct extension should be re-fitted to stack 75 to comply with the requirements of PG6/28 and to allow better dispersion of the fumes and prevent any further re-entrainment into the workshop.



B T Fisher MSc, Dip Occ Hyg, MBIOH,
Consultant Occupational Hygienist

TABLE 1A

PITOT STATIC TUBE MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 17.8.99

STACK No: 38

CIRCULAR DUCT

DUCT DIAMETER: 0.300 m

NUMBER OF POINTS IN TRAVERSE: 6

IN-DUCT TEMPERATURE: 21°C

ATMOSPHERIC PRESSURE: 100.4 kPa

VELOCITY MEASUREMENTS:

Location No	Location Position (mm)	First Traverse (m/s)	Second Traverse (m/s)
1	10	6.5	5.5
2	41	7.0	6.5
3	96	7.0	7.0
4	204	7.5	8.5
5	260	8.0	9.0
6	290	6.5	7.5

RESULTS

AVERAGE VELOCITY 7.21m/s

AVERAGE FLOW 30.6 m³/min

TABLE 1B

TOTAL PARTICULATE MATTER MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 17.8.99

STACK No: 38

SAMPLING NOZZLE SIZE: 5.0 mm

LOCATION (mm)	VELOCITY (m/s)	SAMPLING RATE (l/m)
First Traverse		
45	7.0	8.2
225	8.0	9.4
Second Traverse		
45	6.5	7.7
225	9.0	10.6

INITIAL SAMPLE

TOTAL VOLUME SAMPLED: 184 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.41 mg/m³

DUPLICATE SAMPLE

TOTAL VOLUME SAMPLED: 183.5 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.53 mg/m³

AVERAGE TOTAL PARTICULATE CONCENTRATION 0.47 mg/m³

TABLE 2A

PITOT STATIC TUBE MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 17.8.99

STACK No: 26

CIRCULAR DUCT

DUCT DIAMETER: 0.300 m

NUMBER OF POINTS IN TRAVERSE: 6

IN-DUCT TEMPERATURE: 22°C

ATMOSPHERIC PRESSURE: 100.4 kPa

VELOCITY MEASUREMENTS:

Location No	Location Position (mm)	First Traverse (m/s)	Second Traverse (m/s)
1	10	10.0	9.5
2	41	10.5	11.0
3	96	10.5	11.0
4	204	10.0	10.5
5	260	9.0	10.5
6	290	7.0	8.5

RESULTS

AVERAGE VELOCITY 9.83 m/s

AVERAGE FLOW 41.70 m³/min

TABLE 2B

TOTAL PARTICULATE MATTER MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 17.8.99

STACK No: 26

SAMPLING NOZZLE SIZE: 3.5 mm

LOCATION (mm)	VELOCITY (m/s)	SAMPLING RATE (l/m)
First Traverse		
45	10.5	6.1
255	9.0	5.2
Second Traverse		
45	11.0	6.4
255	10.5	6.1

INITIAL SAMPLE

TOTAL VOLUME SAMPLED: 125 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 2.50 mg/m³

DUPLICATE SAMPLE

TOTAL VOLUME SAMPLED: 123.5 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.35 mg/m³

AVERAGE TOTAL PARTICULATE CONCENTRATION **1.43 mg/m³**

TABLE 3A

PITOT STATIC TUBE MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 19.8.99

STACK No: 35

CIRCULAR DUCT

DUCT DIAMETER: 0.450 m

NUMBER OF POINTS IN TRAVERSE: 6

IN-DUCT TEMPERATURE: 21°C

ATMOSPHERIC PRESSURE: 100.3 kPa

VELOCITY MEASUREMENTS:

Location No	Location Position (mm)	First Traverse (m/s)	Second Traverse (m/s)
1	14	14.0	12.0
2	61	18.0	16.0
3	145	17.0	16.0
4	307	16.0	16.0
5	391	16.5	18.0
6	438	11.0	12.5

RESULTS

AVERAGE VELOCITY 15.25 m/s

AVERAGE FLOW 145.5 m³/min

TABLE 3B

TOTAL PARTICULATE MATTER MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 19.8.99

STACK No: 35

SAMPLING NOZZLE SIZE: 3.5 mm

LOCATION (mm)	VELOCITY (m/s)	SAMPLING RATE (l/m)
First Traverse		
68	18.0	10.4
384	16.5	9.5
Second Traverse		
68	16.0	9.2
384	18.0	10.4

INITIAL SAMPLE

TOTAL VOLUME SAMPLED: 201 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.32 mg/m³

DUPLICATE SAMPLE

TOTAL VOLUME SAMPLED: 201 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.32 mg/m³

AVERAGE TOTAL PARTICULATE CONCENTRATION **0.32 mg/m³**

TABLE 4A

PITOT STATIC TUBE MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 17.8.99

STACK No: 19

CIRCULAR DUCT

DUCT DIAMETER: 0.280 m

NUMBER OF POINTS IN TRAVERSE: 6

IN-DUCT TEMPERATURE: 20°C

ATMOSPHERIC PRESSURE: 100.4 kPa

VELOCITY MEASUREMENTS:

Location No	Location Position (mm)	First Traverse (m/s)	Second Traverse (m/s)
1	9	6.0	6.5
2	38	7.0	7.0
3	90	7.0	7.5
4	190	7.0	7.5
5	242	6.5	7.5
6	271	5.5	5.5

RESULTS

AVERAGE VELOCITY 6.71 m/s

AVERAGE FLOW 24.78 m³/min

TABLE 4B

TOTAL PARTICULATE MATTER MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 17.8.99

STACK No: 19

SAMPLING NOZZLE SIZE: 5.0 mm

LOCATION (mm)	VELOCITY (m/s)	SAMPLING RATE (l/m)
First Traverse		
42	7.0	8.2
238	6.5	7.7
Second Traverse		
42	7.0	8.2
238	7.5	8.8

INITIAL SAMPLE

TOTAL VOLUME SAMPLED: 169 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.44 mg/m³

DUPLICATE SAMPLE

TOTAL VOLUME SAMPLED: 168 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.58 mg/m³

AVERAGE TOTAL PARTICULATE CONCENTRATION **0.51 mg/m³**

TABLE 5A

PITOT STATIC TUBE MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 19.8.99

STACK No: 36

CIRCULAR DUCT

DUCT DIAMETER: 0.280 m

NUMBER OF POINTS IN TRAVERSE: 6

IN-DUCT TEMPERATURE: 21°C

ATMOSPHERIC PRESSURE: 100.3 kPa

VELOCITY MEASUREMENTS:

Location No	Location Position (mm)	First Traverse (m/s)	Second Traverse (m/s)
1	9	7.0	8.0
2	38	10.0	10.5
3	90	11.0	10.5
4	190	10.5	8.0
5	242	8.0	9.5
6	271	6.0	7.0

RESULTS

AVERAGE VELOCITY 8.83 m/s

AVERAGE FLOW 32.62 m³/min

TABLE 5B

TOTAL PARTICULATE MATTER MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 19.8.99

STACK No: 36

SAMPLING NOZZLE SIZE: 3.5 mm

LOCATION (mm)	VELOCITY (m/s)	SAMPLING RATE (l/m)
First Traverse		
42	10.0	5.8
238	8.0	4.6
Second Traverse		
42	10.5	6.1
238	8.0	5.5

INITIAL SAMPLE

TOTAL VOLUME SAMPLED: 114.5 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.66 mg/m³

DUPLICATE SAMPLE

TOTAL VOLUME SAMPLED: 114.5 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.66 mg/m³

AVERAGE TOTAL PARTICULATE CONCENTRATION **0.66 mg/m³**

TABLE 6A

PITOT STATIC TUBE MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 19.8.99

STACK No: 41

CIRCULAR DUCT

DUCT DIAMETER: 0.800 m

NUMBER OF POINTS IN TRAVERSE: 6

IN-DUCT TEMPERATURE: 22°C

ATMOSPHERIC PRESSURE: 100.3 kPa

VELOCITY MEASUREMENTS:

Location No	Location Position (mm)	First Traverse (m/s)	Second Traverse (m/s)
1	26	6.0	5.5
2	108	8.0	9.5
3	257	8.0	9.0
4	543	10.0	9.0
5	692	9.5	9.0
6	774	6.5	6.5

RESULTS

AVERAGE VELOCITY 8.04 m/s

AVERAGE FLOW 242.5 m³/min

TABLE 7A

PITOT STATIC TUBE MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 16.8.99

STACK No: 43

CIRCULAR DUCT

DUCT DIAMETER: 0.525 m

NUMBER OF POINTS IN TRAVERSE: 6

IN-DUCT TEMPERATURE: 28°C

ATMOSPHERIC PRESSURE: 100.3 kPa

VELOCITY MEASUREMENTS:

Location No	Location Position (mm)	First Traverse (m/s)	Second Traverse (m/s)
1	17	6.5	6.0
2	71	8.0	7.0
3	169	8.5	8.5
4	357	8.0	7.0
5	455	7.0	7.5
6	509	5.0	5.5

RESULTS

AVERAGE VELOCITY 7.04 m/s

AVERAGE FLOW 91.44 m³/min

TABLE 7B

TOTAL PARTICULATE MATTER MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 16.8.99

STACK No: 43

SAMPLING NOZZLE SIZE: 5.0 mm

LOCATION (mm)	VELOCITY (m/s)	SAMPLING RATE (l/m)
First Traverse		
79	8.0	9.4
447	7.0	8.2
Second Traverse		
79	7.0	8.2
447	7.5	8.8

INITIAL SAMPLE

TOTAL VOLUME SAMPLED: 177.5 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.07 mg/m³

DUPLICATE SAMPLE

TOTAL VOLUME SAMPLED: 177 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.31 mg/m³

AVERAGE TOTAL PARTICULATE CONCENTRATION **0.19 mg/m³**

TABLE 8A

PITOT STATIC TUBE MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 19.8.99

STACK No: 44

CIRCULAR DUCT

DUCT DIAMETER: 0.460 m

NUMBER OF POINTS IN TRAVERSE: 6

IN-DUCT TEMPERATURE: 22°C

ATMOSPHERIC PRESSURE: 100.3 kPa

VELOCITY MEASUREMENTS:

Location No	Location Position (mm)	First Traverse (m/s)	Second Traverse (m/s)
1	15	17.5	16.5
2	62	18.5	18.0
3	148	19.0	18.5
4	313	18.5	19.0
5	399	19.5	18.0
6	447	19.5	14.5

RESULTS

AVERAGE VELOCITY 18.04 m/s

AVERAGE FLOW 180 m³/min

TABLE 8B

TOTAL PARTICULATE MATTER MEASUREMENT RECORD

FACTORY NAME: V I P

DATE: 19.8.99

STACK No: 44

SAMPLING NOZZLE SIZE: 3.0 mm

LOCATION (mm)	VELOCITY (m/s)	SAMPLING RATE (l/m)
First Traverse		
69	18.5	7.8
392	19.0	8.1
Second Traverse		
69	18.0	7.6
392	18.0	7.6

INITIAL SAMPLE

TOTAL VOLUME SAMPLED: 160 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.14 mg/m³

DUPLICATE SAMPLE

TOTAL VOLUME SAMPLED: 159 Litres

TOTAL PARTICULATE CONCENTRATION
(REF. CONDITIONS): 0.06 mg/m³

AVERAGE TOTAL PARTICULATE CONCENTRATION **0.10 mg/m³**

TABLE 10

SUMMARY OF RESULTS (TOTAL PARTICULATE MATTER.)

(mg/m³)

<u>STACK No.</u>	<u>SAMPLE 1</u>	<u>SAMPLE 2</u>	<u>AVERAGE VALUE.</u>
38	0.41	0.53	0.47
26	2.50	0.35	1.43
19	0.44	0.58	0.51
35	0.32	0.32	0.32
36	0.66	0.66	0.66
41	0.19	0.19	0.19
43	0.07	0.31	0.19
44	0.14	0.06	0.10
30	8.59	2.15	5.37

Nb All results have been corrected to the standard reference conditions of 101.3 kPa and 273°K

TABLE 11**RUBBER FUME VOC RESULTS**

<u>STACK No</u>	<u>FID READING</u>	<u>VOC RESULT</u>
	<u>(ppm CH₄ Equivalent)</u>	<u>(mg C/m³)</u>
6	1	0.5
8	1	0.5
9	1	0.5
10	1	0.5
11	1	0.5
12	1	0.5
14	1	0.5
16	1	0.5
17	1	0.5
18	1	0.5
19	1	0.5
20	1	0.5
21	1	0.5
23	1	0.5
24	1	0.5
25	1	0.5
26	1	0.5
27	1	0.5
28	1	0.5
29	1	0.5
30	1	0.5
32	1	0.5
35	1	0.5
36	1	0.5
37	1	0.5
38	1	0.5
39	1	0.5
40	1	0.5
41	1	0.5
43	1	0.5
60	1	0.5
75	1	0.5

* based on methane equivalents as actual composition unknown