ITEM 4.

A REPORT ON ISOCYANATE EMISSIONS MONITORING AT TRELLEBORG LIMITED, COVENTRY

Prepared for

TRELLEBORG LIMITED

by

ALcontrol Laboratories

Sampling Dates: 17th October 2002
Report Date: 11th November 2002
Issue Number: 1

Prepared by: Sunil Salpekar [redacted]

Authorised by: Jill Cross [redacted]

CLIENT	:	Trelleborg Limited Holbrook Lane Coventry West Midlands CV6 4QX
CONTACT	:	Mr John Davenport
REPORT SUBJECT	:	Emissions Monitoring for Isocyanates
REPORT NUMBER	:	ALR/977/TRE/02
SAMPLE DATES	:	17th October 2002
REPORT DATE	:	11th November 2002
PROJECT CONTACT	:	Sunil Salpekar ALcontrol Laboratories Templeborough House Mill Close Rotherham S60 1BZ Tel: 01709 841103 Fax: 01709 841024

CONTENTS

1. INTRODUCTION

ALcontrol Laboratories were contracted to undertake an emissions investigation at Trelleborg Ltd. The monitoring was undertaken to assess compliance with the limits set for Diphenyl methane di-isocyanates within the site's Authorisation. The monitoring was undertaken for two from local ventilation systems that release emissions to atmosphere

The test work was performed on 17th October 2002.

2. SAMPLING METHODS

2.1. Isocyanates were sampled according to MDHS method 49. A measured volume of flue gas is drawn through a glass impinger containing dimethylformamide and dilute hydrochloric acid. The amount of isocyanate in the sample is determined by spectrophotometric methods.

2.2. Flue Gas Velocity

The flue gas velocity is determined by measurement of the differential pressure and temperature within the stack according to BS3405 (ALcontrol Laboratories, Method Number NAM/8.3/2.1.1).

3. RESULTS

- The results for all the determinands are given in the Tables 1-4.
- All results are averaged and expressed on a wet basis, to STP (273k, 101.3kPa) without correction for oxygen.
- Atmospheric pressure values are obtained from a digital barometer.

3.1. Plant Conditions

DESMA M/C No.1/2

Both production units served by the extraction system were operating under typical conditions on the day of monitoring.

DESMA M/C No.3

The production unit served by the extraction system was operating under typical conditions on the day of monitoring.

3.2. Isocyanates as total NCO Diphenyl methane di-isocyanate

Table 1

DESMA M/C No. 1 & 2

Run Number	Run 1	Run 2
Date	17/10/02	17/10/02
Start Time	10:29	10:59
Stop Time	11:05	11:35
Stack Temperature, °C	25	25
Sample Rate, l/min	1	1
Sample Volume, m^3	0.034	0.034
Stack Velocity, m/s	4.811	4.811
Stack Flow Rate, m^3/s	1.646	1.646
Mass of Isocyanates (as total NCO), µg	<0.2	<0.2
Isocyanates (as total NCO), mg/m^3	<0.01	<0.01
Isocyanates (as total NCO), Kg/hr	<0.001	<0.001

Table 2

DESMA M/C No. 3

Run Number	Run 1	Run 2
Date	17/10/02	17/10/02
Start Time	13:05	13:35
Stop Time	13:40	14:10
Stack Temperature, °C	24	24
Sample Rate, l/min	0.4547	0.4631
Sample Volume, m^3	0.016	0.016
Stack Velocity, m/s	7.588	7.588
Stack Flow Rate, m^3/s	2.596	2.596
Mass of Isocyanates (as total NCO), µg	<0.2	<0.2
Isocyanates (as total NCO), mg/m^3	<0.01	<0.01
Isocyanates (as total NCO), Kg/hr	<0.001	<0.001

4. QUALITY CONTROL

4.1. Equipment used

UNIT	ID Number
Airflow PVM Micromanometer	PI03
Pitot Tube	PT45
Temperature Indicator	TI444
Stack Thermocouple No.	TP144
Barometer	PI08
Timer No.	400634

5. SAMPLING PERSONNEL

Sampling Team: Sunil Salpekar

6. RESULTS SUMMARY

Comparison with Authorisation Limits, mg/m^3, STP, without correction for moisture and oxygen.

Parameter	Test	Result	Mean	Limit
Diphenyl methane di-isocyanate (MDI) as total NCO	1.	<0.01	<0.01	100
	2.	<0.01		

APPENDIX 1

Velocity Measurements

Site Name: Trelleborg Limited
Site Ref: Holbrook Lane, Coventry
Stack Ref: DESMA M/C No. 1 & 2

Date: 17/10/02
Run: Isocyanates 1 & 2

Static Press, mm H_2O:	-350
Barometric press, mm Hg:	750
Stack Diameter, (m):	0.66
Pitot Tube Constant:	1

Traverse Point No.	Port A				Port B			
	Δ p, Pa	Conversion for pitot coefficient	Root Δ p.	Stack Temp °C	Δ p, Pa	Conversion for pitot coefficient	Root Δ p.	Stack Temp °C
1	54.0	55.1	7.423	25	30.0	30.6	5.533	25
2	24.0	24.5	4.948	25	26.0	26.5	5.151	25
3	5.0	5.1	2.259	25	17.0	17.3	4.165	25
4	2.0	2.0	1.428	25	10.0	10.2	3.194	25
5	7.0	7.1	2.672	25	2.0	2.0	1.428	25
6	10.0	10.2	3.194	25	5.0	5.1	2.259	25
7	2.0	2.0	1.428	25	10.0	10.2	3.194	25
8	17.0	17.3	4.165	25	17.0	17.3	4.165	25
9	13.0	13.3	3.642	25	18.0	18.4	4.285	25
10	26.0	26.5	5.151	25	21.0	21.4	4.629	25
Minimum	2.0	2.0	1.428	25.0	2.0	2.0	1.428	25.0
Maximum	54.0	55.1	7.423	25.0	30.0	30.6	5.533	25.0
Average	16.0	16.3	3.631	25.0	15.6	15.9	3.800	25.0
Sum	160.0	163.2	36.311	250.0	160.0	163.2	36.311	250.0
Total Sum					320.0	326.5	72.622	500.0

Max. pitot press. =	55.1	Max. Temp.=	25.0
Min. pitot press. =	2.0	Min. Temp.=	25.0
Ratio Max:Min =	27.0 :1	Mean Temp.=	25.0
		Acceptable Temp. Range =	54.8 to -4.8

Mean Root Δ p	3.716
Mean Stack Temperature, °C	25.00
Traverse Stack Velocity, m/s	4.811
Stack Area, m^2	0.34
Stack Gas Volume Flow Rate, m^3/s (acms)	1.646
Stack Pressure, mm Hg	724.25

Oxygen Correction

Required Correction Value	0
Oxygen Factor	1.000

Site Name: Trelleborg Limited
Site Ref: Holbrook Lane, Coventry
Stack Ref: DESMA M/C No. 3

Date: 17/09/02
Run: VOC Runs 1 & 2

Static Press, mm H_2O:	-110
Barometric press, mm Hg:	750

Stack Diameter, (m):	0.66
Pitot Tube Constant:	1

Traverse Point No.	Port A				Port B			
	Δ p, Pa	Conversion for pitot coefficient	Root Δ p,	Stack Temp °C	Δ p, Pa	Conversion for pitot coefficient	Root Δ p,	Stack Temp °C
1	20.0	20.4	4.517	24	32.0	32.6	5.714	24
2	22.0	22.4	4.738	24	39.0	39.8	6.308	24
3	27.0	27.5	5.249	24	37.0	37.8	6.144	24
4	32.0	32.6	5.714	24	42.0	42.9	6.546	24
5	44.0	44.9	6.700	24	40.0	40.8	6.388	24
6	42.0	42.9	6.546	24	41.0	41.8	6.468	24
7	45.0	45.9	6.776	24	36.0	36.7	6.061	24
8	40.0	40.8	6.388	24	29.0	29.6	5.440	24
9	39.0	39.8	6.308	24	24.0	24.5	4.948	24
10	32.0	32.6	5.714	24	22.0	22.4	4.738	24
Minimum	20.0	20.4	4.5	24.000	22.0	22.4	4.738	24.0
Maximum	45.0	45.9	6.8	24.000	42.0	42.9	6.546	24.0
Average	34.3	35.0	5.9	24.000	34.2	34.9	5.876	24.0
Sum	343.0	343.0	350.0	58.651	240.0	350.0	58.651	240.0
Total Sum					583.0	693.0	408.615	298.7

Max. pitot press. =	45.9	Max. Temp.=	24.0
Min. pitot press. =	20.4	Min. Temp.=	24.0
Ratio Max:Min =	2.3 :1	Mean Temp.=	24.0
		Acceptable Temp. Range =	53.7 to -5.7

Mean Root Δ p	5.870
Mean Stack Temperature, °C	24.00
Traverse Stack Velocity, m/s	7.588
Stack Area, m^2	0.34
Stack Gas Volume Flow Rate, m^3/s (acms)	2.596
Stack Pressure, mm Hg	741.91

Oxygen Correction

Required Correction Value	0
Oxygen Factor	1.000

Gas Calibration Data Sheet

Date : 11/3/05
Site Ref : ~~FCCC~~ N/A
Site Name : ~~TRELLEBORG~~

Stack Ref : BILLET RACK 5
Run No.: VOCs
Analyser / Van : VC07

Datalogger Filename : N/A
Laptop Reference: N/A
Operators: SS

Pre Run Leak Sample System Leak check	(Pass) / Fail
Post Run Leak Sample System Leak check	Pass / Fail

Calibration Gases

Gas Species	Cylinder ID No.	Value	Gas Species	Cylinder ID No.	Value
N_2			NO		
O_2			NO_2		
CO			NOx		
CO_2			THC (C_3H_8)/ (CH_4)	D116332	16.8ppm
SO_2			Fuel Gas (H_2He)	D116946	40 ppm

Calibration Check (Pre - run)

	Low Check	High Check	Low Check	Time
O_2				
CO				
CO_2				
NOx				
NO				
NO_2				
SO_2				
THC	-0.1	16.5	0.0	11:30

Calibration Check (Post – run)

	Low Check	High Check	Low Check	Time
O_2				
CO				
CO_2				
NOx				
NO				
NO_2				
SO_2				
THC	-0.1	16.2	-0.1	13:45

Sample Run Accepted : (YES) / NO

Signed : [redacted]

Date: 11/3/05

Heated Line I.D.	VC07
Gas Sampling Probe I.D.	NOT MEASURED